



United States
Department of
Agriculture

Soil
Conservation
Service

Spokane,
Washington



Washington Water Supply Outlook

January 1, 1986



A57.46/7.1

Foreward

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado (New Mexico)	2490 West 26th Ave., Denver, CO 80211
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	50 South Virginia Street, Third Floor, Reno, NV 89505
Oregon	1220 Southwest 3rd Ave., 15th Floor, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82602

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 95802; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Saskatchewan, and N.W.T. — The Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta, T3C 1A6.



Washington Water Supply Outlook

and

**Federal — State — Private
Cooperative Snow Surveys**

Issued by

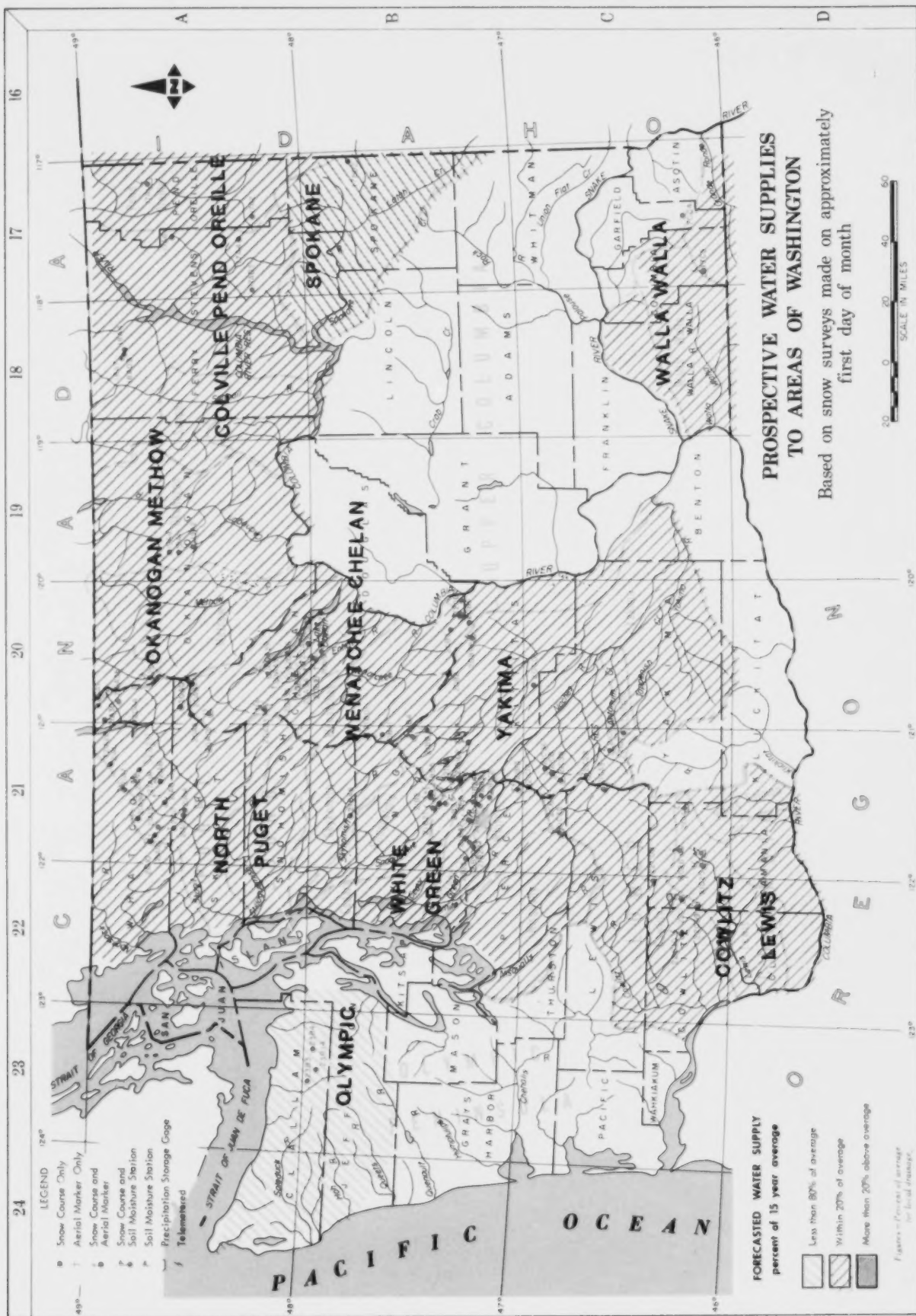
Wilson Scalling
Chief
Soil Conservation Service
Washington, D.C.

Released by

Lynn A. Brown
State Conservationist
Soil Conservation Service
Spokane, Washington

Prepared by

William F. Weller
Water Supply Specialist
Room 360 U.S. Courthouse
Spokane, Washington 99201



INDEX to WASHINGTON SNOW COURSES, SOIL MOISTURE STATIONS and PRECIPITATION STORAGE GAGES

NAME	NUMBER	SIC	TRP	DATE	SLY
UPPER COLUMBIA DRAINAGE					
Bayer Mountain	17A2	7	31N	43E	5250
Bunchgrass Meadow	17A1SP	24	37N	44E	5000
Summit G. S.	18A7	20	39N	35E	4600
Butte Creek	18A3	28	39N	32E	4710
Coat Creek	18A4	26	39N	32E	4590
Rogged Ridge	17B02	12	27N	45E	3333
Colville River	17A5	26	31N	38E	4990
Chenelish	17A4	11	32N	41E	4925
Mutton Creek No. 1	19A1	30	37N	24E	5700
Mutton Creek No. 2	19A4	19	37N	24E	6000
Salmon Meadows	19A2SP	33	37N	24E	4500
Harts Pass	20A5SP	7	37N	18E	6500
Chelan Lake Basin	20A23SP	18	31N	16E	5900
Lyman Lake	20A12SP	10	34N	16E	4600
Park Creek Ridge	20A9SP	21	35N	17E	4740
Rainy Pass	20A3SP	30	31N	18E	5600
Winnier Lake	20A3SP	30	31N	18E	5600
Enlatot River	20B19	34	28N	19E	1600
Bluff	20A33a	2	31N	17E	4540
Enlatot Meadows	20A34a	2	29N	17E	3325
Enlatot River Trail	20A36a	17	30N	18E	6510
Fox Camp	20B20	22	29N	18E	3540
Pope Ridge	20B24SP	22	29N	18E	3540
Pope Ridge	20A32a	34	30N	18E	6725
Pugh Ridge	20A37	20	29N	17E	6000
Shady Pass	20A37	20	29N	17E	6000
Snow Brushy	20A35a	11	28N	17E	4910
Tommy Creek	20B21a	10	28N	18E	4900
Wenatchee River	21B41SP	13	26N	14E	3240
Berne-Mill Creek (New)	21B41SP	13	26N	14E	3240
Stewart Pass No. 2	21B15P	14	32N	13E	4270
Shawnee Pass	21B15P	14	32N	13E	4270
Trough #2	20B25SP	10	20N	20E	5310
Beahive Springs	20B83	12	21N	19E	4400
Stemilt Creek	20B86	30	21N	20E	5000
Upper Wheeler	20B75P	30	21N	20E	4400
Yakima River	21C11	24	12N	14E	3100
Albion R. S.	21B95P	35	23N	14E	3200
Rio Bonilla	21C8P	23	16N	12E	3450
Bumping Lake	21C36	13	16N	12E	3400
Bumping Lake New	21C36	13	16N	12E	3400
Bumping Ridge	21C38SP	9	15N	12E	4600
Fish Lake	21B45P	28	24N	14E	3371
Green Lake	21C10SP	3	12N	13E	6000
Grouse Camp	20B11SP	29	21N	19E	5285
Miller Creek Elm	21B45P	28	24N	14E	3371
Miller Creek	21C15P	4	16N	11E	5400
Tunnel Avenue	21B8P	13	21N	11E	2450
White Pass (East Side)	21C28SP	2	13N	11E	4500
LOWER COLUMBIA DRAINAGE					
Spurce Springs	17C4	9	8N	40E	5700
Touchet No. 2	17C5SP	6	7N	40E	5530
June Lake	22C09SP	26	8N	5E	3200
Lone Pine Shelter	22C26SP	8	9N	7E	3800
Plains of Abraham	22C1SP	35	9N	5E	4400
Spencer Meadow	22C20SP	16	8N	7E	3400
Surprise Lakes	22C13SP	14	7N	8E	4250
Coyote Pass	21C65SP	15	16N	10E	5300
Pigtail Lake	21C65SP	15	16N	10E	5300
Plains Hill	21C14SP	36	10N	10E	4500
Sheep Canyon	22C10SP	12	8N	4E	4050
Strawberry	22C08SP	9	10N	6E	3780
PUGET SOUND DRAINAGE					
Paradise Park (New)	21C35SP	13	15N	8E	5500
White River	21B13SP	30	18N	11E	6000
Comal Pass	21B24P	18	20N	11E	1800
Alstrip Creek	21B25P	27	21N	8E	1200
Charley Creek	21B42SP	21	21N	9E	3200
Chapman Mountain	21B27	14	20N	8E	2900
Grass Mountain No. 2	21B28	12	20N	8E	2100
Grass Mountain No. 3	21B29	36	20N	10E	3100
Leiter Creek	21B50	22	20N	8E	4000
Lynn Lake	21B31	5	19N	11E	4700
Sawmill Ridge	21B10SP	25	21N	11E	3860
Stompede Pass	21B30	16	19N	11E	4100
Twin Camp	21B30	16	19N	11E	4100
City Cabin	21B5	10	21N	10E	2200
Mt. Gardner	21B21P	30	22N	10E	3300
Alpine Meadows	21B48	31	27N	9E	3500
Olallie Meadows	21B2P	19	22N	11E	3625
Olallie Meadows East	21B55SP	20	22N	11E	3700
Snoqualmie River	21A4	35	39N	12E	2200
Skagit River	21A4	35	39N	12E	2200
Beaver Creek Trail	21A4	35	39N	12E	2200
Beaver Pass	21A2B	26	40N	12E	5600
Beaver Park	21A2B	26	40N	12E	5600
Drifts Park	20A4	34	38N	16E	5900
Freeseout Creek Trail	20A1	14	40N	14E	3500
Freeseout Meadows (New)	20A3B	8	40N	16E	5000
Granite Creek	20A06	25	36N	16E	3500
Meadows Cabin	20A8	29	36N	14E	1900
New-Hosameen Lake	21A30	19	40N	14E	2800
Thunder Basin	20A07	10	35N	14E	4200
OLYMPIC PENINSULA					
Duck Butte	21A11A	8	36N	8E	3800
Easy Pass	21A7A	19	39N	11E	5200
Jasper Pass	21A6A	17	38N	11E	5400
Marten Lake	21A9A	23	38N	8E	3600
Mount Blum	21A18a	20	37N	8E	2100
Sockeye Creek	21A12aP	20	37N	8E	2100
Sockeye Meadow	21A12aP	20	37N	8E	2100
S. Fork Miller Creek	21A14A	20	36N	9E	2200
Sulphur Creek	21A13	22	37N	8E	1600
Three Mile Creek	21A15	18	36N	9E	1600
Watson Lakes	21A8P	25	37N	9E	4500
DEER PARK					
Deer Park	23B4	1	28N	5W	5200
HURRICANE					
Hurricane	23B3	36	29N	7W	4500
COX VALLEY					
Cox Valley	23B14	31	29N	6W	4500

LEGEND

- 21A1 Snow Course Only
- 21A2 Snow Course And Aerial Marker
- 21A3 Snow Course And Aerial Marker
- 21A4 Snow Course And Aerial Marker
- 21A5 Snow Course And Aerial Marker
- 21A6 Snow Course And Aerial Marker
- 21A7 Snow Course And Aerial Marker
- 21A8 Snow Course And Aerial Marker
- 21A9 Snow Course And Aerial Marker
- 21A10 Snow Course And Aerial Marker
- 21A11 Snow Course And Aerial Marker
- 21A12 Snow Course And Aerial Marker
- 21A13 Snow Course And Aerial Marker
- 21A14 Snow Course And Aerial Marker
- 21A15 Snow Course And Aerial Marker
- 21A16 Snow Course And Aerial Marker
- 21A17 Snow Course And Aerial Marker
- 21A18 Snow Course And Aerial Marker
- 21A19 Snow Course And Aerial Marker
- 21A20 Snow Course And Aerial Marker
- 21A21 Snow Course And Aerial Marker
- 21A22 Snow Course And Aerial Marker
- 21A23 Snow Course And Aerial Marker
- 21A24 Snow Course And Aerial Marker
- 21A25 Snow Course And Aerial Marker
- 21A26 Snow Course And Aerial Marker
- 21A27 Snow Course And Aerial Marker
- 21A28 Snow Course And Aerial Marker
- 21A29 Snow Course And Aerial Marker
- 21A30 Snow Course And Aerial Marker
- 21A31 Snow Course And Aerial Marker
- 21A32 Snow Course And Aerial Marker
- 21A33 Snow Course And Aerial Marker
- 21A34 Snow Course And Aerial Marker
- 21A35 Snow Course And Aerial Marker
- 21A36 Snow Course And Aerial Marker
- 21A37 Snow Course And Aerial Marker
- 21A38 Snow Course And Aerial Marker
- 21A39 Snow Course And Aerial Marker
- 21A40 Snow Course And Aerial Marker
- 21A41 Snow Course And Aerial Marker
- 21A42 Snow Course And Aerial Marker
- 21A43 Snow Course And Aerial Marker
- 21A44 Snow Course And Aerial Marker
- 21A45 Snow Course And Aerial Marker
- 21A46 Snow Course And Aerial Marker
- 21A47 Snow Course And Aerial Marker
- 21A48 Snow Course And Aerial Marker
- 21A49 Snow Course And Aerial Marker
- 21A50 Snow Course And Aerial Marker
- 21A51 Snow Course And Aerial Marker
- 21A52 Snow Course And Aerial Marker
- 21A53 Snow Course And Aerial Marker
- 21A54 Snow Course And Aerial Marker
- 21A55 Snow Course And Aerial Marker
- 21A56 Snow Course And Aerial Marker
- 21A57 Snow Course And Aerial Marker
- 21A58 Snow Course And Aerial Marker
- 21A59 Snow Course And Aerial Marker
- 21A60 Snow Course And Aerial Marker
- 21A61 Snow Course And Aerial Marker
- 21A62 Snow Course And Aerial Marker
- 21A63 Snow Course And Aerial Marker
- 21A64 Snow Course And Aerial Marker
- 21A65 Snow Course And Aerial Marker
- 21A66 Snow Course And Aerial Marker
- 21A67 Snow Course And Aerial Marker
- 21A68 Snow Course And Aerial Marker
- 21A69 Snow Course And Aerial Marker
- 21A70 Snow Course And Aerial Marker
- 21A71 Snow Course And Aerial Marker
- 21A72 Snow Course And Aerial Marker
- 21A73 Snow Course And Aerial Marker
- 21A74 Snow Course And Aerial Marker
- 21A75 Snow Course And Aerial Marker
- 21A76 Snow Course And Aerial Marker
- 21A77 Snow Course And Aerial Marker
- 21A78 Snow Course And Aerial Marker
- 21A79 Snow Course And Aerial Marker
- 21A80 Snow Course And Aerial Marker
- 21A81 Snow Course And Aerial Marker
- 21A82 Snow Course And Aerial Marker
- 21A83 Snow Course And Aerial Marker
- 21A84 Snow Course And Aerial Marker
- 21A85 Snow Course And Aerial Marker
- 21A86 Snow Course And Aerial Marker
- 21A87 Snow Course And Aerial Marker
- 21A88 Snow Course And Aerial Marker
- 21A89 Snow Course And Aerial Marker
- 21A90 Snow Course And Aerial Marker
- 21A91 Snow Course And Aerial Marker
- 21A92 Snow Course And Aerial Marker
- 21A93 Snow Course And Aerial Marker
- 21A94 Snow Course And Aerial Marker
- 21A95 Snow Course And Aerial Marker
- 21A96 Snow Course And Aerial Marker
- 21A97 Snow Course And Aerial Marker
- 21A98 Snow Course And Aerial Marker
- 21A99 Snow Course And Aerial Marker
- 21A100 Snow Course And Aerial Marker

GENERAL OUTLOOK

SUMMARY:

THE WATER SUPPLY FORECAST FOR WASHINGTON WILL BE PUBLISHED IN JANUARY FOR THE FIRST TIME. THE REPORT IS ALSO BEING PRINTED IN A NEW FORMAT THAT WILL CONFORM WITH WATER SUPPLY FORECASTS WESTWIDE.

SNOWPACK:

Washington's snowpack is below normal for January 1. Most basins are less than 80% of normal. The Baker River has 52%, the Green River 78%, and the Skykomish River is at 70%. Several areas within the state do not have any snowcourses read this report. Forecasted streamflows are for near normal to below normal flows for the summer.

PRECIPITATION:

Precipitation has varied greatly by month, with 200% of normal in many areas for October and less than 10% of normal for December in others. Some of the readings for October were 266% for Wenatchee, 204% for Yakima, 229% for North Puget and 151% for the Spokane. December was a reversal of this trend, North Puget Sound had 14%, the Olympics 19%, Colville 20% and the Yakima 33%. Water Year precipitation is now running about 75% of normal statewide.

RESERVOIRS:

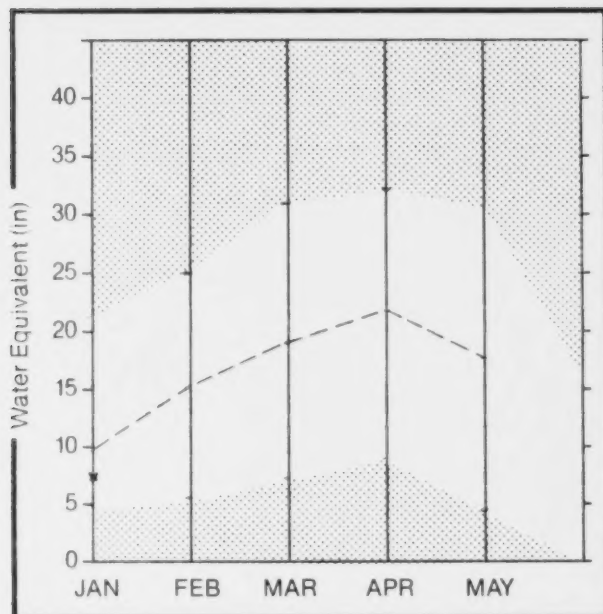
Reservoir storage is below average in the state. Storage within the Yakima River reservoirs is the second lowest in the past ten years. Banks and Roosevelt Lakes are at 71% of average.

STREAMFLOW:

December streamflow has been below normal statewide except in the Spokane River where the flow was 101% of normal. Because of ice flows most eastside stream data is unreliable. Westside streams were significantly affected by cold and dry weather. Flows in the Cowlitz were 37% of average, the Chehalis - 42% and the Skykomish at 25%. The Columbia River at the International Boundary was 82% of normal.

SPOKANE

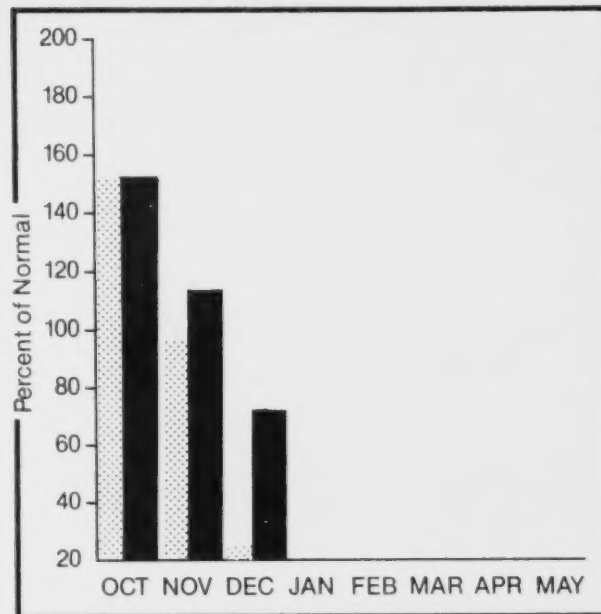
Mountain snowpack* (inches)



*Based on selected stations

Maximum  Average 
 Minimum  Current 

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation  Year to date precipitation 

SPOKANE RIVER BASIN

WATER SUPPLY OUTLOOK:

The forecasted streamflow for the Spokane River is below normal for the spring and summer with 77 percent. December streamflow in the Spokane River was 101% of normal. Snow cover in the 5 courses that were read was at 72% of average, but the snowcover is only 33% of that measured in 1985. Temperatures averaging 10 degrees below normal maintained the snowpack that fell in November. December precipitation was 21% of average while the accumulative water year total is 74% of average. Storage in Coeur d' Alene Lk. is 18%

For more information contact your local Soil Conservation Service office.

SPOKANE RIVER BASIN

STREAMFLOW FORECASTS

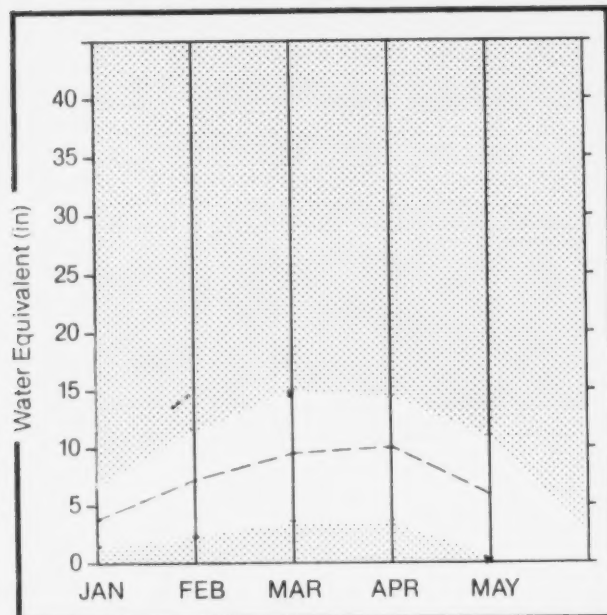
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	HIGH FLOW (CFS)	LOW DATE
SPOKANE at Post Falls	APR-SEP	2848.0	2200.0	77.8	128.2	26.3				
	APR-JUL	2754.0	2130.0	77.0	128.4	26.3				

RESERVOIR STORAGE (1000AF)		WATERSHED SNOWPACK ANALYSIS						
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE THIS YEAR	USEABLE STORAGE LAST YEAR	USEABLE STORAGE AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	% OF AVERAGE
COEUR D'ALENE	225.1	25.5	49.9	142.6	Spokane River	10	35	71

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

COLVILLE AND PEND OREILLE

Mountain snowpack* (inches)



*Based on selected stations

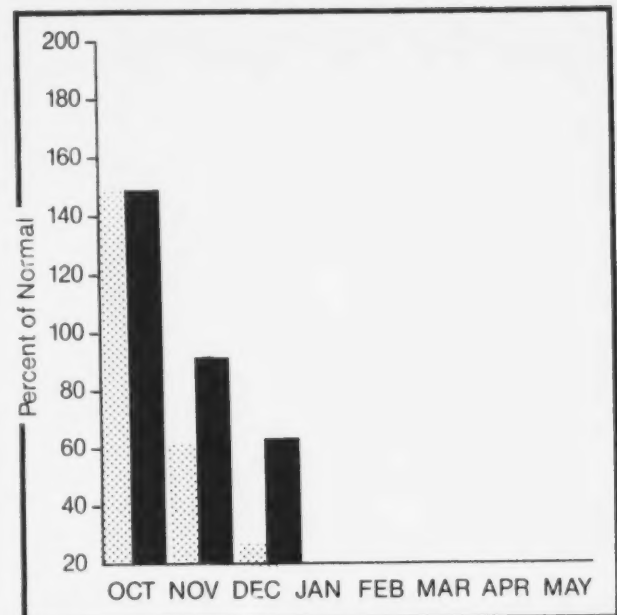
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

COLVILLE - PEND OREILLE RIVER BASINS

WATER SUPPLY OUTLOOK:

Cold and dry has been the norm for weather in the Colville - Pend Oreille River Basins. November-December temperatures averaged 12 degrees below normal. December precipitation was at 27% of average with an accumulated water year of 63% of average. The Pend Oreille River flow for December was at 82% of normal. Snow pack for eight courses reporting in the Pend Oreille Basin was at 72% of average. Forecasted streamflow for the basin is near average with 87 percent.

For more information contact your local Soil Conservation Service office.

COLVILLE - PEND OREILLE RIVER BASINS

STREAMFLOW FORECASTS

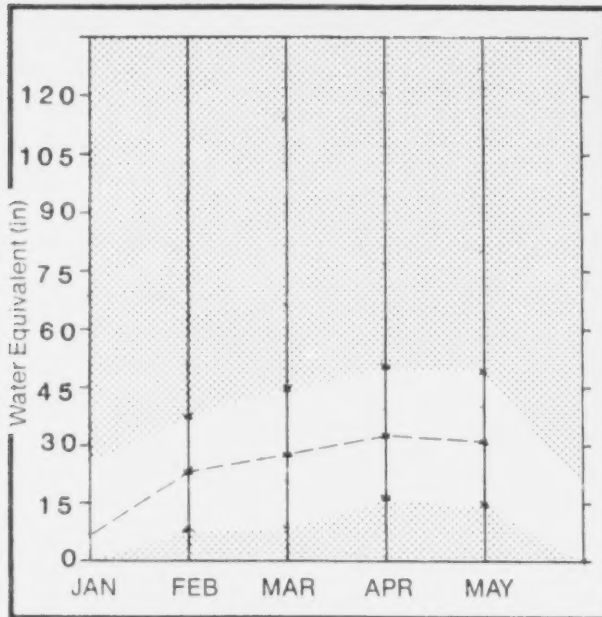
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
PEND OREILLE RIVER bl Box Canyon	APR-SEP	15425.0	13400.0	86.0	112.9	60.9				
	APR-JUL	14156.0	12300.0	86.0	112.9	60.9				
	APR-JUN	12227.0	10640.0	87.0	113.0	61.0				
COLVILLE RIVER at Kettle Falls	APR-SEP	134.0	127.0	94.0	144.8	44.8				
	APR-JUL	123.0	116.0	94.0	144.7	44.7				
	APR-JUN	114.0	108.0	94.0	144.7	44.7				
KETTLE RIVER nr Laurier	APR-SEP	1829.0	1740.0	95.0	140.1	50.1				
	APR-JUL	1738.0	1650.0	94.0	139.9	49.9				
	APR-JUN	1581.0	1500.0	94.0	139.8	49.9				
COLUMBIA RIVER at Birchbank *	APR-SEP	44605.0	41700.0	93.0	115.5	71.5				
	APR-JUL	35705.0	33400.0	93.0	115.5	71.5				
	APR-JUN	26027.0	24470.0	94.0	116.0	72.0				
COLUMBIA RIVER at Grand Coulee *	APR-SEP	66841.0	60500.0	90.0	112.5	68.5				
	APR-JUL	56169.0	50900.0	90.0	112.6	68.6				
	APR-JUN	44036.0	40070.0	90.0	113.0	69.0				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE THIS YEAR	USEABLE STORAGE LAST YEAR	USEABLE STORAGE AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE
ROOSEVELT	5232.0	3293.0	4889.5	4547.9	Colville River	0	0
BANKS	715.0	391.0	672.2	618.3	Pend Oreille River	10	40
					Kettle River	0	0
					Omac Lake, Twin Lakes	0	0
					Newman Lake	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

OKANOGAN AND METHOW

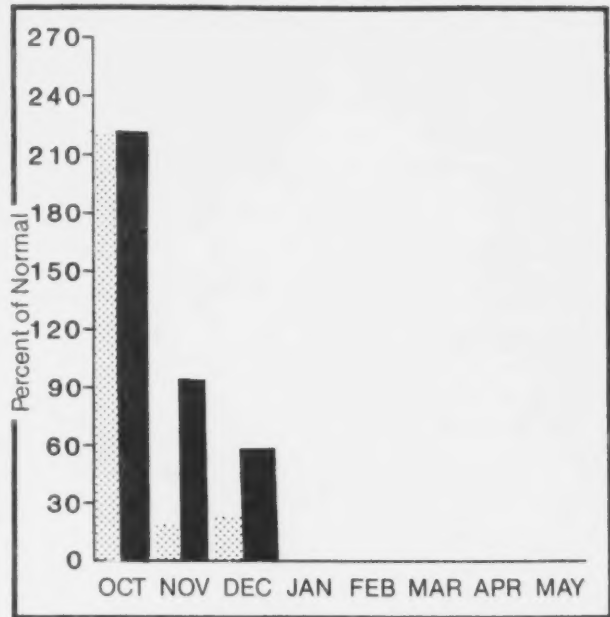
Mountain snowpack* (inches)



*Based on selected stations

Maximum  Average 
Minimum  Current 

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation  Year to date precipitation 

OKANOGAN - METHOW RIVER BASINS

WATER SUPPLY OUTLOOK:

Snowpack in the Okanogan-Methow Basins is 76% of average for the January 1 snow surveys. The cold dry trend in the weather has affected the snowpack and streamflows resulting in below average readings. December precipitation was 22% of normal. Reservoir storage is at 101% of the current 20 year average. Forecasted streamflow for the watersheds calls for near normal runoff for the spring and summer months. The Okanogan River is forecasted at 82%, with the Methow River at 85% of average.

For more information contact your local Soil Conservation Service office.

OKANOGAN - METHOW RIVER BASINS

STREAMFLOW FORECASTS

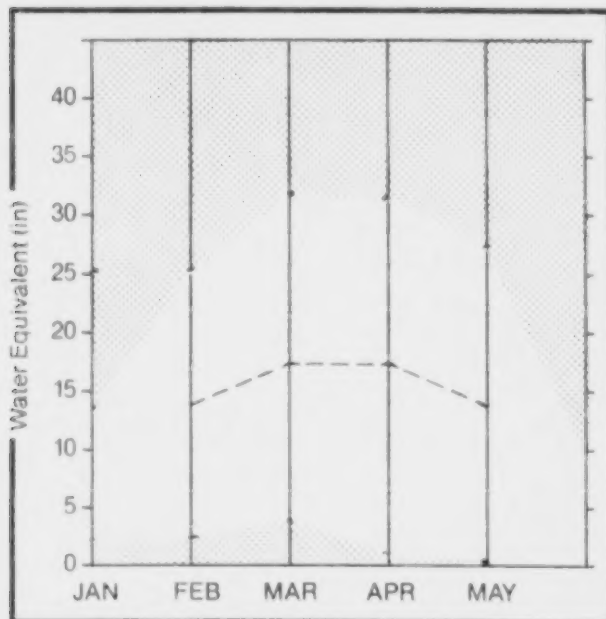
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	PEAK MAX. (% AVE.)	PEAK MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SIMILKAMEEN R. nr Nighthawk	AFR-SEP	1462.0	1200.0	82.0	154.1	10.1				
	AFR-JUL	1365.0	1120.0	82.0	154.1	10.0				
	AFR-JUN	1161.0	950.0	81.0	153.8	9.8				
OKANOGAN R. nr Tonasket	AFR-SEP	1644.0	1310.0	79.0	152.7	6.7				
	AFR-JUL	1497.0	1190.0	79.0	152.8	6.5				
	AFR-JUN	1262.0	1010.0	80.0	153.0	7.1				
METHOW RIVER nr Pateros	AFR-SEP	980.0	833.0	85.0	119.0	51.0				
	AFR-JUL	908.0	772.0	85.0	119.1	51.0				
	AFR-JUN	773.0	657.0	84.0	119.0	51.0				

RESERVOIR STORAGE (1000AF)				WATERSHED SNOWPAC ANALYST		
RESERVOIR	USEABLE CAPACITY	THIS YEAR	USEABLE STORAGE LAST YEAR AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE
				Okanogan River	10	82
				Methow River	2	51

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WENATCHEE AND CHELAN

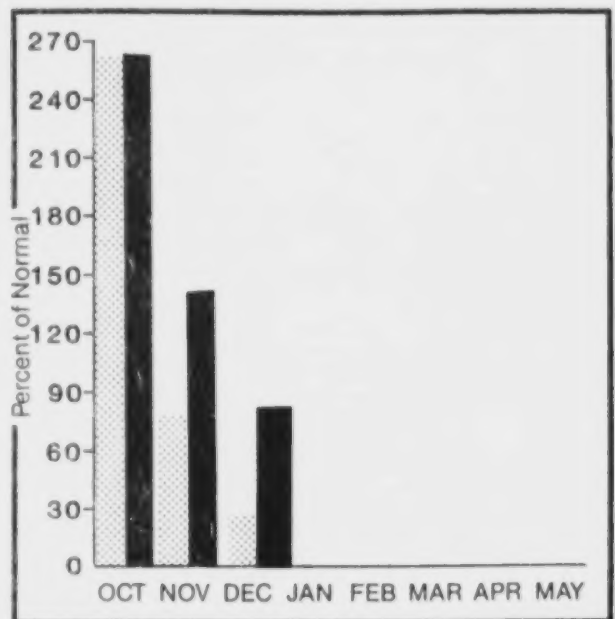
Mountain snowpack* (inches)



*Based on selected stations

Maximum ——— Average - - - -
Minimum ——— Current ———

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation ——— Year to date precipitation ———

WENATCHEE - CHELAN RIVER BASINS

WATER SUPPLY OUTLOOK:

The Wenatchee - Chelan Basins have 74% and 73% of snow cover at the January 1 readings. December streamflow was below average with ice fouling the stream gages. Precipitation for December was 25% of normal bringing the water year total to 84% of normal. Inflows to Lake Chelan for December were below normal due to the cold dry weather. Temperatures averaged 10 degrees below normal for November and December. Streamflows for summer will be near normal with Wenatchee at 91% and Chelan 85%.

For more information contact your local Soil Conservation Service office.

WENATCHEE - CHELAN RIVER BASINS

STREAMFLOW FORECASTS

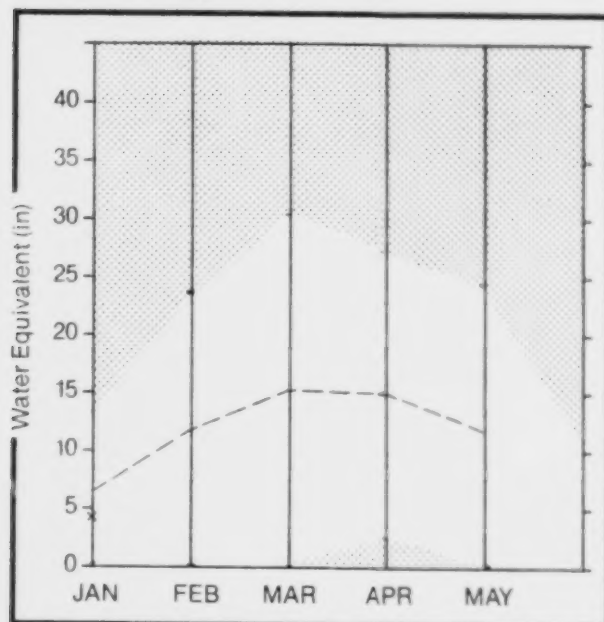
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
CHELAN RIVER at Chelan *	APR-SEP	1203.0	1020.0	84.0	113.8	55.8				
	APR-JUL	1055.0	896.0	84.0	113.9	55.9				
	APR-JUN	826.0	702.0	84.0	114.0	55.9				
STEMERIN P. at Stehelin	APR-SEP	860.0	817.0	95.0	120.0	70.0				
	APR-JUL	727.0	691.0	95.0	120.1	70.0				
	APR-JUN	550.0	525.0	94.0	119.9	70.0				
ENTIAT RIVER nr. Ardenwood	APR-SEP	234.8	211.0	89.0	89.9	89.9				
	APR-JUL	213.0	191.0	89.0	89.7	89.7				
	APR-JUN	172.0	155.0	90.0	90.1	90.1				
WENATCHEE RIVER at Plain	APR-SEP	1270.0	1160.0	91.0	127.3	55.4				
	APR-JUL	1113.0	1010.0	90.0	126.8	54.7				
	APR-JUN	899.0	820.0	91.0	127.3	55.2				
STEMILT nr. Wenatchee (winers in)	MAY-SEP	138.0	126.0	91.0	91.3	91.3				
ICICLE CREEK nr. Leavenworth	APR-SEP	370.0	333.0	90.0	90.0	90.0				
	APR-JUL	340.0	306.0	90.0	90.0	90.0				
	APR-JUN	270.0	243.0	90.0	90.0	90.0				
COLUMBIA R. at Rock Island Dam *	APR-SEP	72781.0	66200.0	90.0	115.0	67.0				
	APR-JUL	61601.0	56100.0	91.0	115.1	67.1				
	APR-JUN	48384.0	44000.0	90.0	114.9	66.9				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	THIS YEAR	** USEABLE STORAGE **	LAST YEAR AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE	
CHELAN LAKE	676.1	365.7	---	378.7	Chelan Lake Basin	4	56	73
					Entiat River	0	0	0
					Wenatchee River	5	53	73
					Coluckum Creek	1	120	113
					Squilchuck Creek	0	0	0
					Stemilt Creek	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

YAKIMA

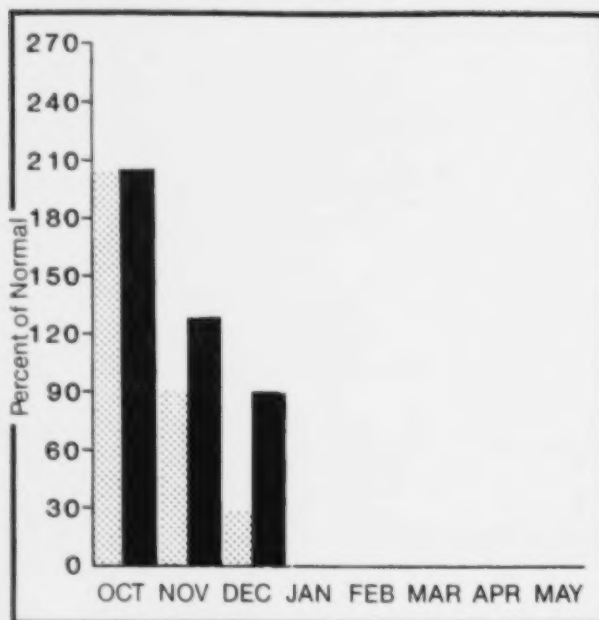
Mountain snowpack* (inches)



*Based on selected stations

Maximum ——— Average - - - -
Minimum Current ———

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation [hatched bar] Year to date precipitation [solid black bar]

YAKIMA RIVER BASIN

WATER SUPPLY OUTLOOK:

Yakima River snow cover is 76% of normal with 13 of 28 snow courses being read for the January 1 report. Reservoir storage is 72% of normal with the reservoirs holding 403-thousand acre feet. December precipitation was 27% of average bringing the water year total down to 80% of normal. Below average temperature for November and December kept the streamflow low and caused icing problems at the gages. Forecasted flows for spring and summer are for near normal with the Yakima at 85%.

For more information contact your local Soil Conservation Service office.

YAKIMA RIVER BASIN

STREAMFLOW FORECASTS

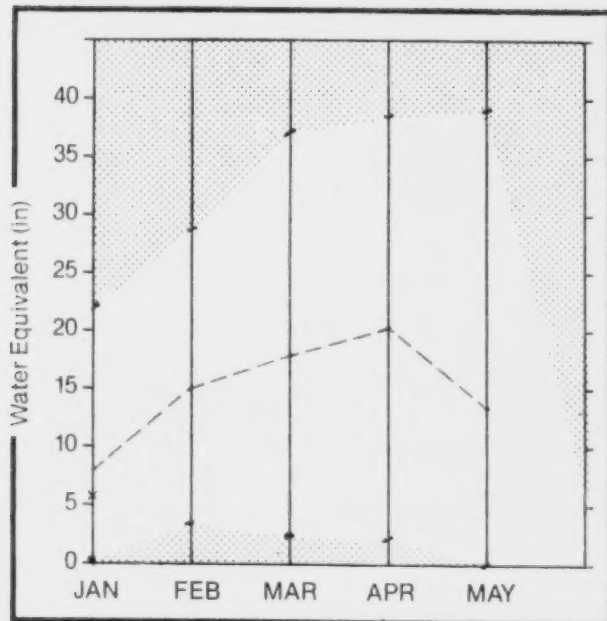
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
YAKIMA RIVER at Martin *	APR-SEP	139.0	118.0	84.0	100.7	69.1				
	APR-JUL	128.0	108.0	84.0	100.0	68.7				
	APR-JUN	111.0	94.0	84.0	100.9	68.5				
YAKIMA RIVER at Cle Elum *	APR-SEP	943.0	754.0	79.0	96.0	63.9				
	APR-JUL	854.0	683.0	79.0	96.0	63.9				
	APR-JUN	734.0	567.0	79.0	95.9	64.0				
YAKIMA RIVER nr Parker *	APR-SEP	2096.0	1800.0	85.0	112.7	58.9				
	APR-JUL	1898.0	1630.0	85.0	112.7	58.9				
	APR-JUN	1667.0	1430.0	85.0	112.8	58.8				
KACHESS RIVER nr Easton *	APR-SEP	121.0	99.0	81.0	99.2	64.5				
	APR-JUL	115.0	94.0	81.0	99.1	64.3				
	APR-JUN	101.0	83.0	82.0	99.0	65.3				
CLE ELUM RIVER nr Roslyn *	APR-SEP	463.0	384.0	82.0	97.8	68.0				
	APR-JUL	422.0	350.0	82.0	97.9	68.0				
	APR-JUN	353.0	293.0	83.0	98.0	68.0				
BUMPING RIVER nr Nile *	APR-SEP	142.0	122.0	85.0	114.8	57.0				
	APR-JUL	129.0	111.0	86.0	114.7	57.4				
	APR-JUN	107.0	92.0	85.0	115.0	57.0				
AMERICAN RIVER nr Nile	APR-SEP	124.0	99.0	79.0	109.7	50.0				
	APR-JUL	113.0	90.0	79.0	109.7	49.6				
	APR-JUN	94.0	75.0	79.0	109.6	50.0				
TIEBON RIVER at Tieton *	APR-SEP	246.0	197.0	80.0	110.2	50.0				
	APR-JUL	207.0	166.0	80.0	110.1	50.2				
	APR-JUN	165.0	132.0	80.0	110.3	50.3				
KACHES RIVER nr Naches *	APR-SEP	867.0	736.0	84.0	116.8	52.9				
	APR-JUL	784.0	666.0	84.0	117.0	52.9				
	APR-JUN	667.0	567.0	85.0	116.9	53.1				
ANTHONY CREEK nr Tappan *	APR-SEP	47.0	34.0	72.0	117.0	27.7				
	APR-JUL	43.0	31.0	72.0	116.3	27.9				
	APR-JUN	37.0	27.0	72.0	118.9	27.0				

RESERVOIR STORAGE		(1000AF)		WATERSHED SNOWPACK ANALYSIS				
RESERVOIR	USEABLE CAPACITY	THIS YEAR	LAST YEAR	USEABLE STORAGE AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
YEECHELUS	157.8	59.2	84.2	83.0	Yakima River	11	65	75
KACHESS	239.0	98.1	145.0	159.1	Anthony Creek	2	89	82
CLE ELEM	436.9	118.5	174.4	230.2				
BUMPING LAKE	33.7	4.3	3.8	4.3				
KIMROCK	198.0	118.8	99.6	102.1				

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

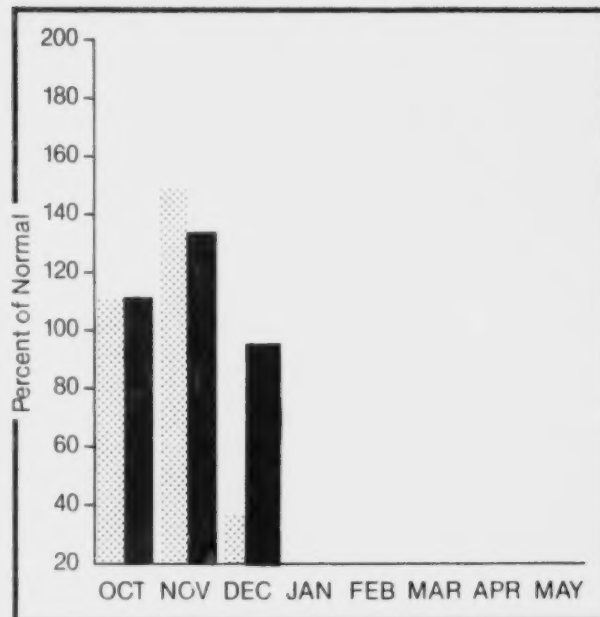
WALLA WALLA

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum



Average



Minimum



Current



Monthly precipitation



Year to date precipitation



WALLA WALLA RIVER BASIN

WATER SUPPLY OUTLOOK:

Streamflows for the Walla Walla Basin are expected to be near average for the spring and summer months. Precipitation was down to 37% of normal for December, but water year precipitation is at 94% of average. Snow cover for the area for January 1 was % of normal. Streamflow in the Basin was below average primarily due to the cold weather and icing of the streams. forecasted streamflows in the Walla Walla area are for 90% of average.

For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS

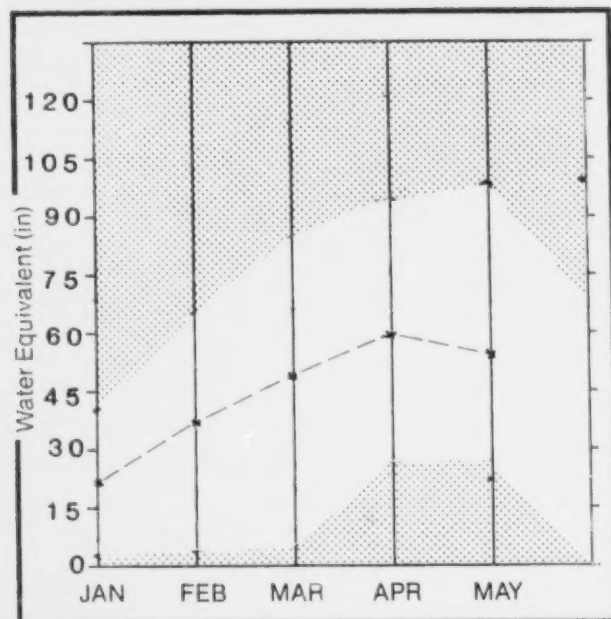
RESERVOIR STORAGE

WATERSHED SNOWPACK ANALYSIS

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

COWLITZ AND LEWIS

Mountain snowpack* (inches)



*Based on selected stations

Maximum



Average



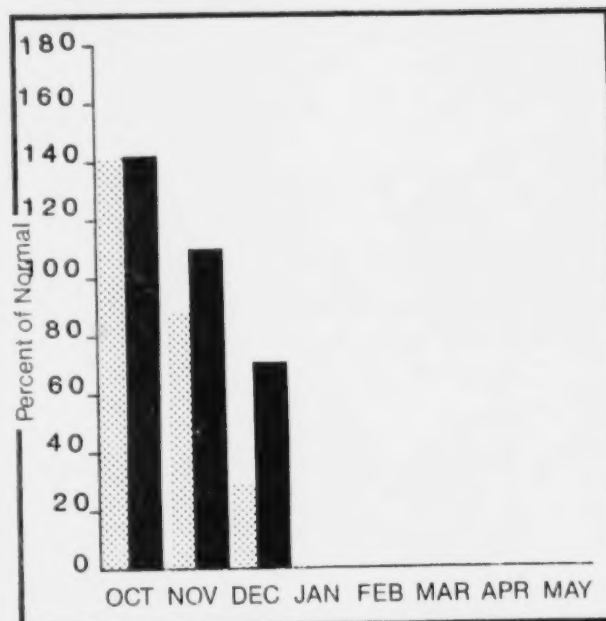
Minimum



Current



Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation



Year to date precipitation



COWLITZ - LEWIS RIVER BASINS

WATER SUPPLY OUTLOOK:

Snow cover for the Cowlitz - Lewis Basin is at 63% of average. Streamflows are forecasted near normal for spring and summer with the Lewis River at 98% and the Cowlitz at 85%. Precipitation has been below average for December at 24% and for the water year at 71%. The cold dry weather has also reduced the areas streamflow with the Cowlitz reporting 37% of average flow for December with temperatures eight degrees below normal

For more information contact your local Soil Conservation Service office.

COWLITZ - LEWIS RIVER BASINS

STREAMFLOW FORECASTS

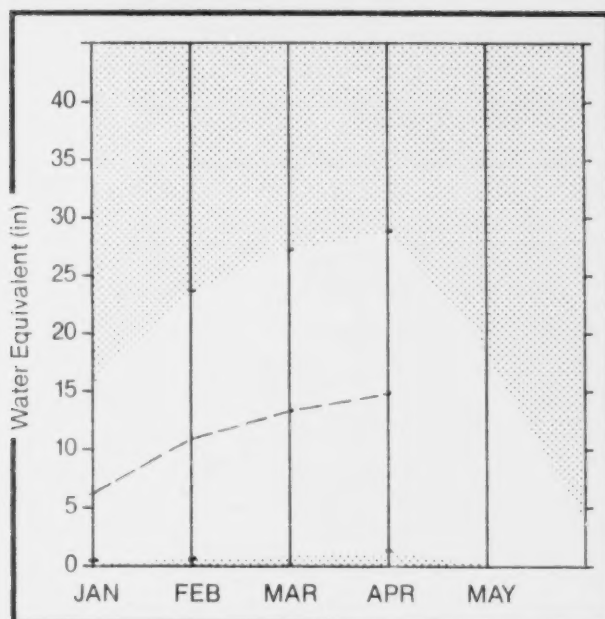
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
LEWIS RIVER at Ariel *	APR-SEP	1249.0	1230.0	98.0	140.5	56.4				
	APR-JUL	1086.0	1060.0	97.0	139.8	55.8				
	APR-JUN	961.0	940.0	97.0	139.9	55.8				
COWLITZ R. b1 Mayfield Dam *	APR-SEP	2038.0	1740.0	85.0	130.4	40.4				
	APR-JUL	1778.0	1520.0	85.0	130.5	40.5				
	APR-JUN	1502.0	1280.0	85.0	130.2	40.2				
COWLITZ R. at Castle Rock *	APR-SEP	2673.0	2310.0	86.0	111.4	61.4				
	APR-JUL	2323.0	2010.0	86.0	111.5	61.5				
	APR-JUN	1980.0	1720.0	86.0	111.9	61.9				

RESERVOIR STORAGE (1000AF)		WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **	WATERSHED	NO. COURSES
	THIS YEAR	LAST YEAR AVE.		AVE.D
			Cowlitz River	1
			Lewis River	2
				THIS YEAR AS % OF LAST YR. AVERAGE
				48
				69

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

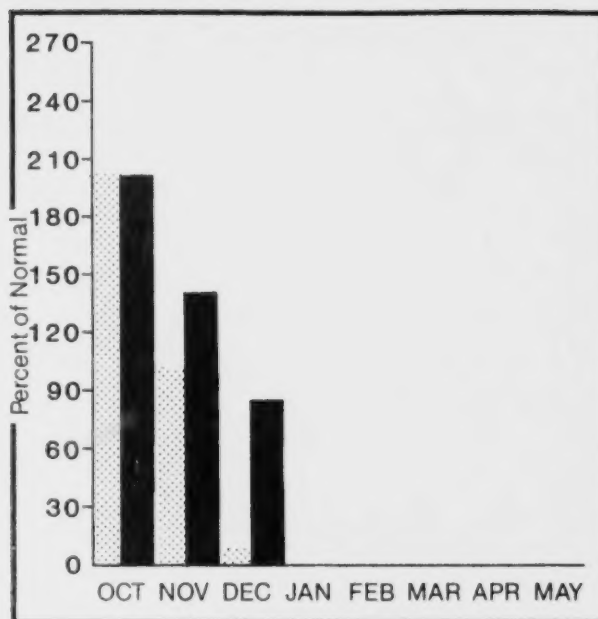
WHITE - GREEN

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum 
Minimum 

Average 
Current 

Monthly precipitation 

Year to date precipitation 

WHITE - GREEN RIVER BASINS

WATER SUPPLY OUTLOOK:

Summer stream flows are forecasted to be near average with the Green River at 88%. Water year precipitation has been at 85% of normal, with December at 21% November at 101%. Snowpack is at 70% of average with nine snowcourses reporting. Area streamflow for December was near 40% of average.

For more information contact your local Soil Conservation Service office.

WHITE - GREEN RIVER BASINS

STREAMFLOW FORECASTS

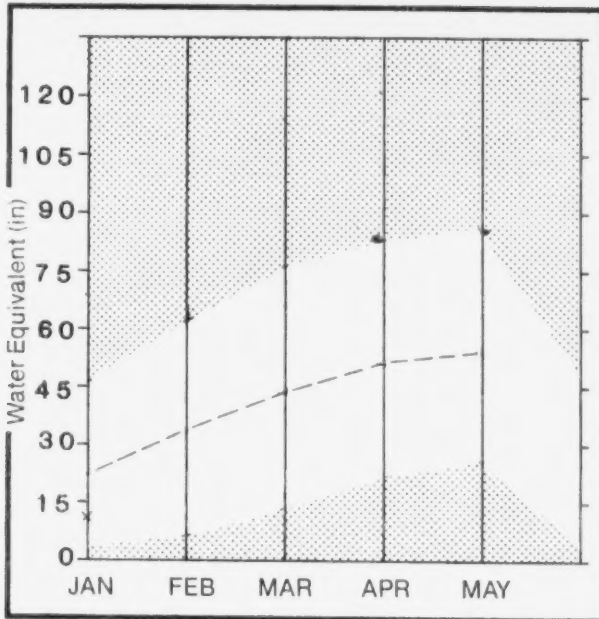
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
GREEN RIVER bl Howard Hanson Dam *	APR-SEP	316.0	252.0	79.0	79.7	79.7				
	APR-JUL	284.0	227.0	79.0	79.9	79.9				
	APR-JUN	256.0	204.0	79.0	79.7	79.7				
CEDAR RIVER nr Cedar Falls	APR-SEP	93.0	83.0	89.0	89.2	89.2				

RESERVOIR STORAGE (1000AF)		WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE	WATERSHED	NO. COURSES AVE.D
	THIS YEAR	LAST YEAR AVE.		
			White River	2 75 70
			Green River	2 33 71

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

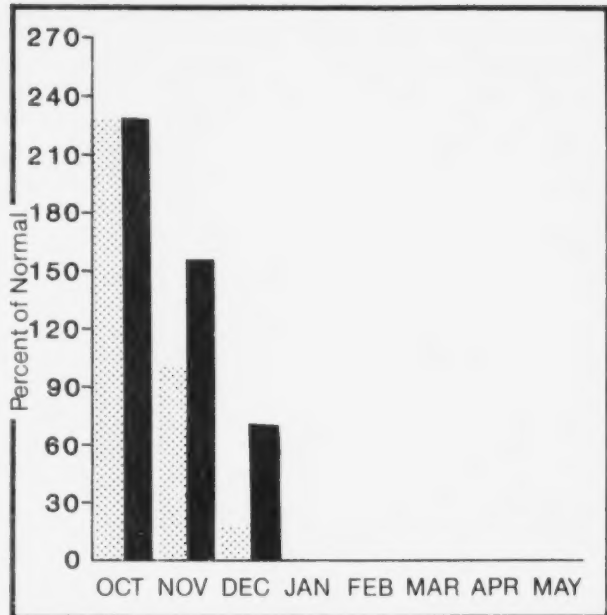
NORTH PUGET SOUND

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum Minimum

Average Current

Monthly precipitation

Year to date precipitation

NORTH PUGET SOUND RIVER BASINS

WATER SUPPLY OUTLOOK:

Snow cover in the North Puget Basins is below the 1961-1980 average, with Baker River at 52% and Skagit River at 78%. December temperatures averaged five degrees below average for December. Precipitation for December was 14% of normal bringing the water year total to 96% of average. Reservoir storage is below normal at 25%. Streamflows in the Skykomish River were at 25% of normal for December. Forecasted streamflow for area rivers is for near normal runoff for spring and summer with the Skagit at 85%.

For more information contact your local Soil Conservation Service office.

NORTH PUGET SOUND RIVER BASINS

STREAMFLOW FORECASTS

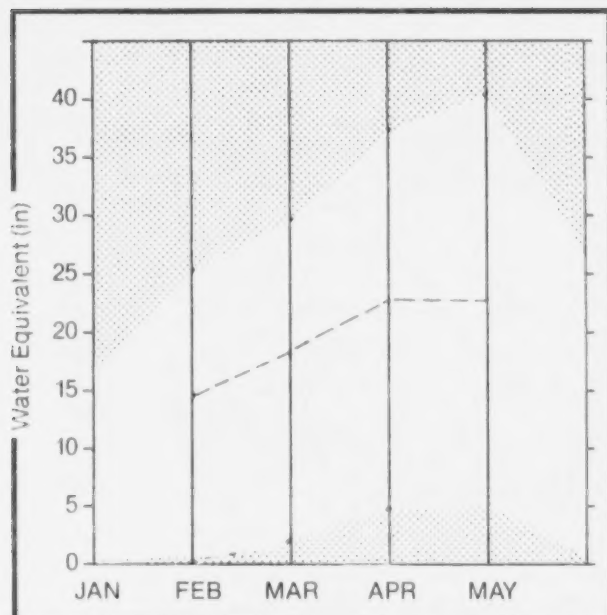
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SKAGIT RIVER at Newhalem *	APR-SEP	2356.0	2000.0	84.0	110.9	58.9				
	APR-JUL	1972.0	1670.0	84.0	110.7	58.7				
	APR-JUN	1485.0	1260.0	84.0	110.8	58.9				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE THIS YEAR	USEABLE STORAGE LAST YEAR	USEABLE STORAGE AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
ROSS	1404.1	1094.0	1083.7	---	Skagit River	3	35	3
DIABLO RESERVOIR	90.6	84.8	83.5	---	Baker River	8	32	52
GORGE RESERVOIR	9.8	7.6	7.9	---	Cedar River	0	0	0
					Snoqualmie River	0	0	0
					Skykomish River	2	43	70

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

OLYMPIC

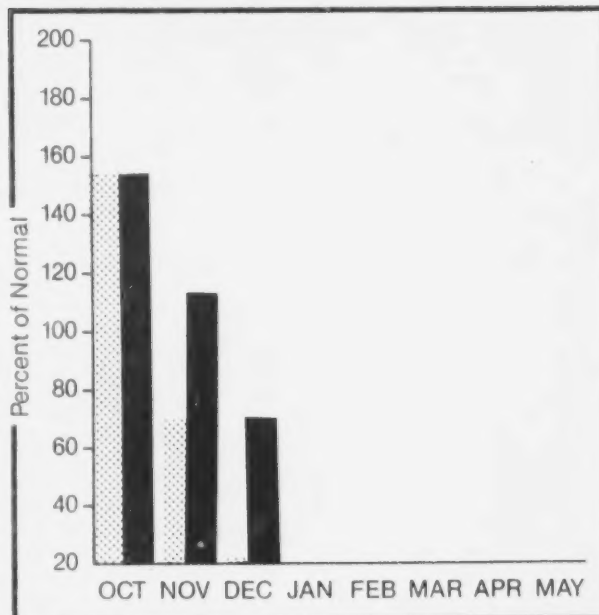
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average
Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

OLYMPIC PENINSULA RIVER BASINS

WATER SUPPLY OUTLOOK:

Precipitation for December has been below average at 19% for the Olympic Basins. Water year precipitation is at 70% of normal. Snow cover is estimated to be near 90% with only Carrol Pass snow pillow for data. December temperatures were three degrees below normal. Area streamflows were below normal for December due to the cold dry weather. Streamflows for the coming months are expected to be below normal with flows of 75%.

For more information contact your local Soil Conservation Service office.

OLYMPIC PENINSULA RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	FEAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
DUNGENESS RIVER nr Sequia	APR-SEP	160.0	120.0	75.0	75.0	75.0				
	APR-JUL	130.0	98.0	75.0	75.4	75.4				
	APR-JUN	97.0	73.0	75.0	75.3	75.3				
ELUHA RIVER nr Port Angeles	APR-SEP	553.0	415.0	75.0	75.0	75.0				
	APR-JUL	454.0	340.0	74.0	74.9	74.9				

RESERVOIR STORAGE (1000AF)				WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE	USEABLE STORAGE	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF
	THIS YEAR	LAST YEAR	AVE.			LAST YR. AVE.D
				Dungeness River	0	0
				Morse Creek	0	0
				Eluha River	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.



The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

- Canada:** Ministry of the Environment, Water
Investigations Branch, Victoria, British Columbia
- States:** Washington State Department of Ecology
Washington State Department of Natural Resources
- Federal:** Department of the Army
Corps of Engineers
U.S. Department of Agriculture
Forest Service
U.S. Department of Commerce
NOAA, National Weather Service
U.S. Department of the Interior
Bonneville Power Administration
Bureau of Reclamation
Geological Survey
National Park Service
- Local:** City of Tacoma
City of Seattle
Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company
Snohomish County P.U.D.
- Private:** Okanogan Irrigation District
Wenatchee Heights Irrigation District
Newman Lake Homeowners Association

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

986/2



United States
Department of
Agriculture

Soil
Conservation
Service

Spokane
Washington



Washington Water Supply Outlook

February 1, 1986



A 57.46/7:

Foreword

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado (New Mexico)	2490 West 26th Ave., Denver, CO 80211
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	50 South Virginia Street, Third Floor, Reno, NV 89505
Oregon	1220 Southwest 3rd Ave., 16th Floor, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82602

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 95802; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Saskatchewan, and N.W.T. — The Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta, T3C 1A6.

Washington Water Supply Outlook

and

**Federal — State — Private
Cooperative Snow Surveys**

Issued by

Wilson Scaling
Chief
Soil Conservation Service
Washington, D.C.

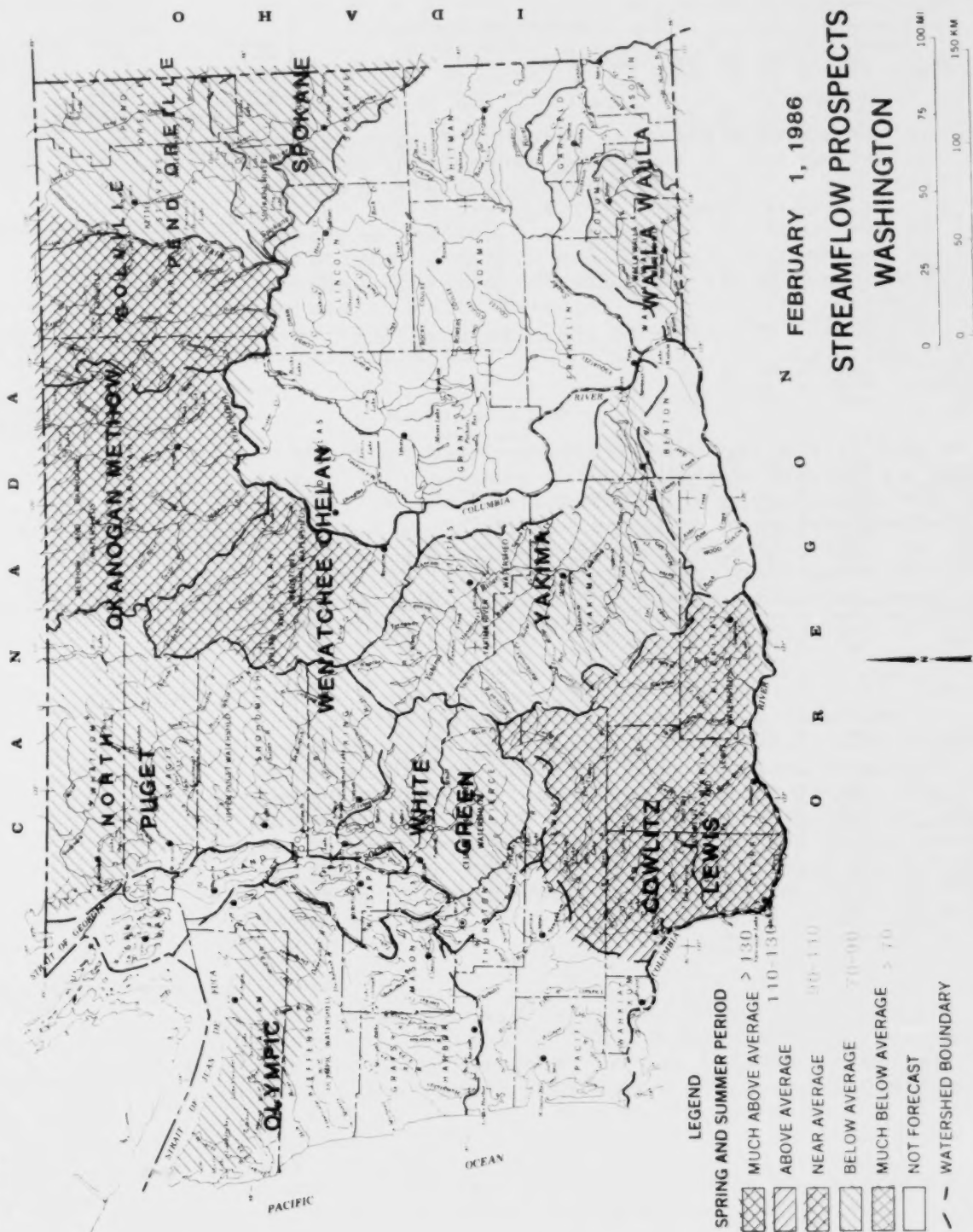
Released by

Lynn A. Brown
State Conservationist
Soil Conservation Service
Spokane, Washington

Prepared by

William F. Weller
Water Supply Specialist
Room 360 U.S. Courthouse
Spokane, Washington 99201





INDEX to WASHINGTON SNOW COURSES,
SOIL MOISTURE STATIONS and PRECIPITATION STORAGE GAGES

SOIL MOISTURE STATIONS AND PRECIPITATION STATIONS

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
UPPER COLUMBIA DRAINAGE					
Pend Oreille River					
Boyer Mountain	17A2	7	31N	43E	5250
Bunchgrass Meadow	17A1SP	24	37N	44E	5000
Kettle River					
Summit G. S.	18A7	20	39N	35E	4600
Butte Creek	18A3	28	39N	35E	4070
Goat Creek	18A4	26	39N	35E	3595
Spokane River					
Ragged Ridge	17B02	12	27N	45E	3333
Colville River					
Baird	17A6	19	36N	42E	3215
Stranger Mountain	17A5	26	31N	38E	4990
Chewelah	17A4	11	32N	41E	4925
Okanogan River					
Mutton Creek No. 1	19A1	30	37N	24E	5700
Mutton Creek No. 2	19A4	19	37N	24E	6000
Salmon Meadows	19A2SP	33	37N	24E	4500
Methow River					
Harts Pass	20A5SP	7	37N	18E	6500
Chelan Lake Basin					
Lyman Lake	20A23SP	18	31N	16E	5900
Park Creek Ridge	20A12SP	18	34N	16E	4600
Rainy Pass	20A9SP	21	35N	17E	4780
Mirror Lake	20A39	30	31N	18E	5600
Entiat River					
Brief	20B19	34	28N	19E	1600
Entiat Meadows	20A33a	28	31N	17E	4540
Entiat River Trail	20A34a	2	29N	17E	3325
Fox Camp	20A36a	17	30N	18E	6510
Pope Ridge	20B20	22	29N	18E	3540
Pope Ridge Snow Pillow	20B24SP	22	29N	18E	6725
Pugh Ridge	20A32a	34	30N	18E	6200
Shady Pass	20A37	20	29N	19E	6200
Snow Brushy	20A35a	21	30N	17E	3910
Tammy Creek	20B21a	10	28N	18E	4900
Wenatchee River					
Berna-Mill Creek (New)	21B41SP	13	26N	14E	3240
Blewett Pass No. 2	20B25P	35	22N	17E	4270
Stevens Pass	21B15P	14	26N	13E	4070
Trough #2	20B25SP	10	20N	20E	5310
Squilchuck Creek					
Beehive Springs	20B3	12	21N	19E	4400
Stemilt Creek					
Stemilt Slide	20B6	30	21N	20E	5000
Upper Wheeler	20B7SP	30	21N	20E	4400
Yakima River					
Ahtanum R. S.	21C11	24	12N	14E	3100
Big Boulder Creek	21B95P	35	23N	14E	3200
Bumping Lake	21C8P	23	16N	12E	3450
Bumping Lake New	21C36	13	16N	12E	3400
Bumping Ridge	21C38SP	9	15N	12E	4600
Fish Lake	21B45P	28	24N	14E	3371
Green Lake	21C10SP	3	12N	13E	6000
Grouse Camp	20B11SP	29	21N	19E	5385
Lake Cle Elum	21B14M	15	20N	14E	2200
Morse Lake	21C17SP	6	16N	11E	2450
Tunnel Avenue	21B8P	13	21N	11E	4500
White Pass (East Side)	21C28SP	2	13N	11E	4500

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
LOWER COLUMBIA DRAINAGE					
Asotin Creek					
Spruce Springs	17C4	9	8N	40E	5700
Touchet River					
Touchet No. 2	17C5SP	6	7N	40E	5530
Lewis River					
June Lake	22C09SP	26	8N	5E	3200
Lone Pine Shelter	21C26SP	8	9N	7E	3800
Plains of Abraham	22C15P	35	9N	5E	4400
Spencer Meadow	21C20SP	16	8N	7E	3400
Surprise Lakes	21C13SP	14	7N	8E	4250
Cowlitz River					
Cayuse Pass	21C6	15	16N	10E	5300
Pigtail Peak	21C35P	11	13N	11E	5900
Potato Hill	21C14SP	36	10N	10E	4500
Sheep Canyon	22C10SP	12	8N	4E	4050
Strawberry	22C08SP	9	10N	6E	3280

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Baker River					
Dock Butte	21A11A	8	36N	8E	3800
Easy Pass	21A7A	19	39N	11E	5200
Jasper Pass	21A6A	17	38N	11E	5400
Marten Lake	21A9A	23	38N	8E	3600
Mount Blum	21A18a	27	38N	10E	5800
Rocky Creek	21A12AP	20	37N	8E	2100
Schreibers Meadow	21A10AP	18	37N	8E	3400
S. F. Thunder Creek	21A14A	20	36N	9E	2200
Sulphur Creek	21A13	22	37N	8E	1600
Three Mile Creek	21A15	18	36N	9E	1600
Watson Lakes	21A8P	25	37N	9E	4500

OLYMPIC PENINSULA

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Dungeness River					
Deer Park	23B4	1	28N	5W	5200
Elwha River					
Hurricane	23B3	36	29N	7W	4500
Cox Valley					
	23B14	31	29N	6W	4500

LEGEND

- 21A1 Snow Course Only
- 21A7A Aerial Marker Only
- 21A7A Snow Course And Aerial Marker
- 21A7M Snow Course And Soil Moisture Station
- 21A7M Soil Moisture Station
- 21A7P Snow Course And Precipitation Storage Gage
- 21A7P Precipitation Storage Gage
- 21A7SP Snow Pillow

GENERAL OUTLOOK

SUMMARY:

The February 1 snowpack is below average for the west slope of the Cascade Mountains of Washington and the extreme eastern portion of the state. Snowcover is near or above average for the east slopes of the Cascade mountains. Streamflows continued to be below average for January, while precipitation was above average. Forecasted streamflows vary from near average to below average. In the below average are Olympics 74%, Green 76%, Spokane 75% and the Pend Oreille at 85%.

SNOWPACK:

Snowpack in Washington varied greatly with 60% of normal in the Elwah and Green River basins to 138% of average in the Squilchuck Basin above Wenatchee. Snow surveys taken in other areas of the state show the following snow cover; Spokane and Pend Oreille 71%, Cowlitz 82%, and the Skagit 90%, Okanogan 112%, Wenatchee 36%, Yakima 90%, Walla Walla 81%, Cowlitz 82% and the Skagit 90%.

PRECIPITATION:

Precipitation was above normal over most of Washington during January. Extremely heavy rainfall occurred January 18 with some stations reporting new record maximum 24 hour precipitation rates. The northwest slopes of the Cascades were 100% of average while the south west slope were at 97%. The eastern slopes of the Cascades were 107% of average and the northeast area of Washington was 141% of normal for January.

RESERVOIRS:

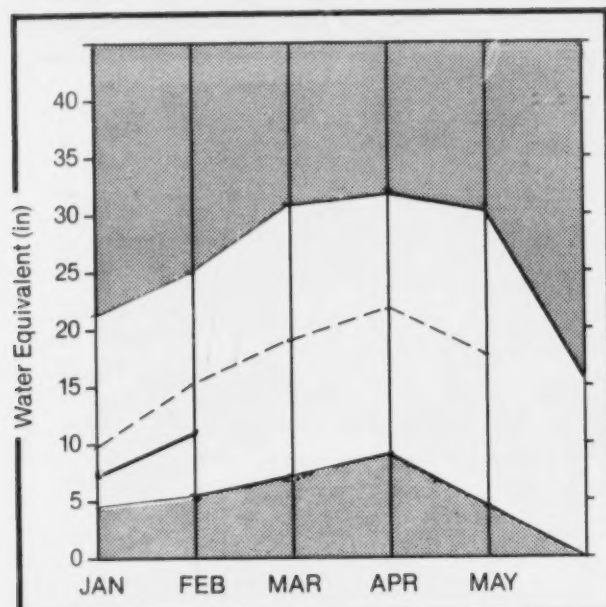
Reservoir storage continued below normal for January. Storage in the Yakima Basin as reported by the Bureau of Reclamation was 441,000 acre feet or 61% of the normal February 1 storage. Irrigation reservoirs in the Okanogan area were at 76% of normal storage. Power storage reservoirs at Chelan are at 60% and Coeur d' Alene is at 25% of normal. Reservoir storage is still showing the effects of a cold, dry December and January.

STREAMFLOW:

January streamflow was below normal. The western side of the state had 80% of normal runoff on the Cowlitz River, 99% on the Chehalis, and 93% on the Skykomish River. The eastern slope of the Cascades had 81% of normal runoff from Lake Chelan, 69% from the Wenatchee River, and 40% from the Yakima River. Flows from the Columbia River at the international boundary were 90% of the January normal and 82% at The Dalles. The Spokane River was 49% of normal and the Pend Oreille River was at 84%.

SPOKANE

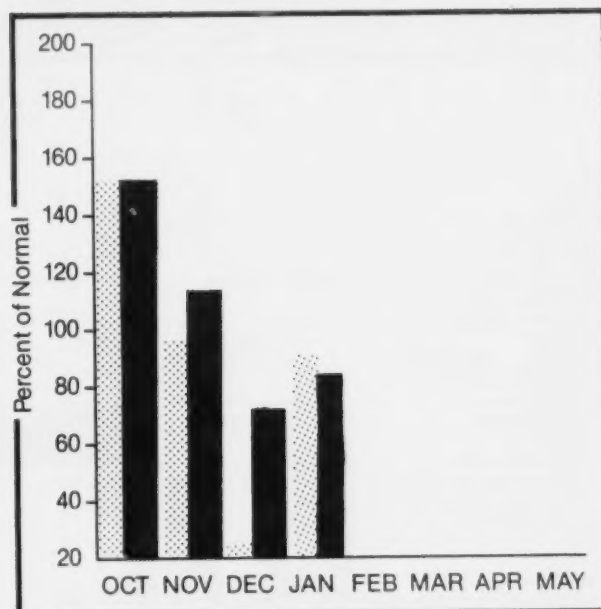
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average
Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

SPOKANE RIVER BASIN

WATER SUPPLY OUTLOOK:

The forecasted streamflows show no improvement for February 1, with 75% of average for the Spokane River. Precipitation was 91% of the January normal, reducing the water year total to 82% of average. Streamflow for the Spokane River is reported to be 49% of normal for January. Spokane temperatures were 4 degrees above normal for January. Storage in Coeur d' Alene Lake is 25% of average. Snowpack for the Basin was 69% of normal for February first.

For more information contact your local Soil Conservation Service office.

SPOKANE RIVER BASIN

STREAMFLOW FORECASTS

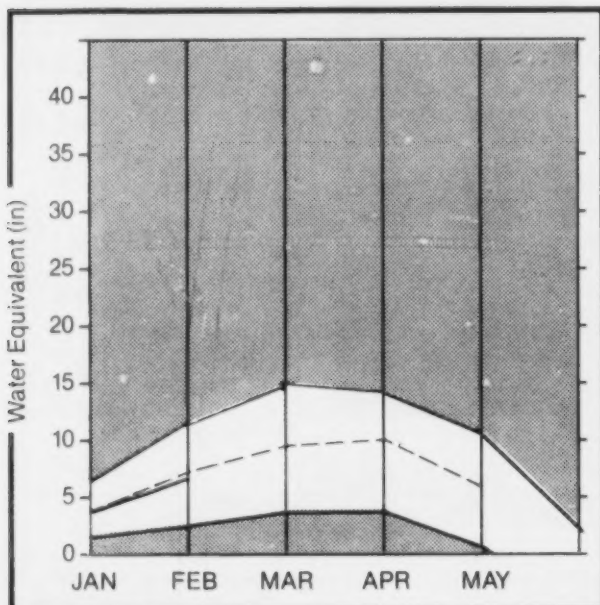
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SPOKANE at Post Falls	APR-SEP	2848.0	2160.0	75	112	40				
	APR-JUL	2754.0	2090.0	75	112	40				

RESERVOIR STORAGE (1000AF)				WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.	WATERSHED	NO. COURSES AVE.D	* THIS YEAR AS % OF LAST YR. AVERAGE
COEUR D'ALENE	225.1	59.2	31.3	142.4	Spokane River	12	60 69

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

COLVILLE AND PEND OREILLE

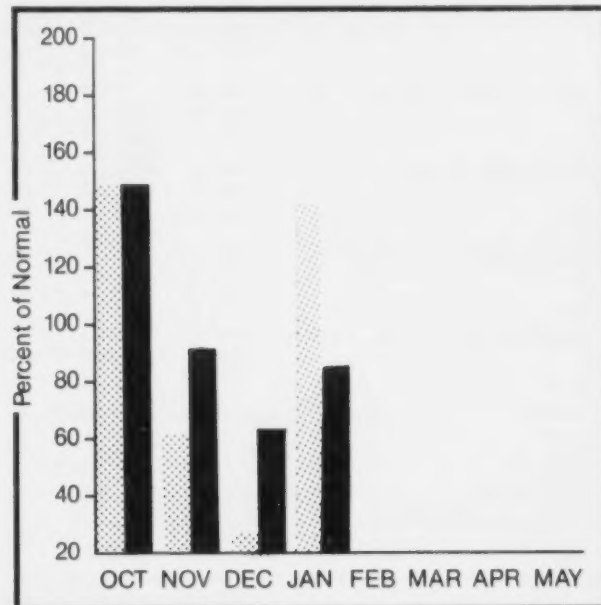
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average
Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

COLVILLE - PEND OREILLE RIVER BASINS

WATER SUPPLY OUTLOOK:

Forecasted stream flows vary over the basin, with 78% predicted for the Pend Oreille River, 100% on the Kettle River and 85% on the Colville River. Temperatures were 5 degrees above average for January while precipitation was 145% of the January normal. The above average precipitation raised the water year total to 84% of normal. January streamflows were 84% of average on the Pend Oreille, while the Kettle gage was iced in. Snowpack varied from 70% of normal on the Pend Oreille to 95% on the Kettle River.

For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS

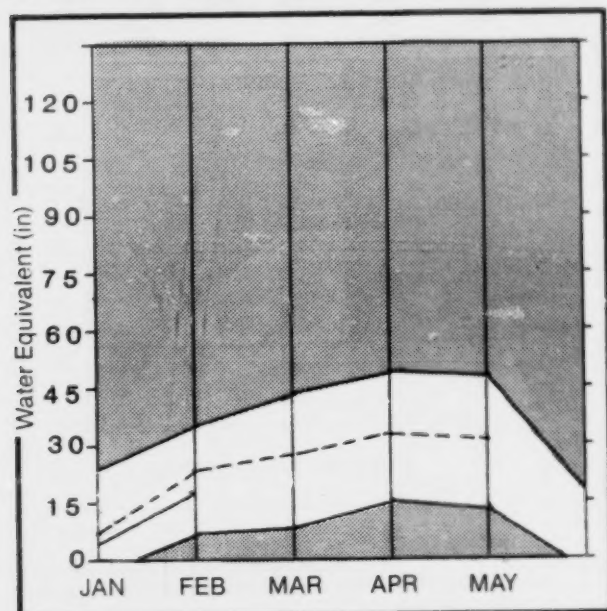
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
PEND OREILLE RIVER bl Box Canyon	APR-SEP	15425.0	12000.0	77	100	54				
	APR-JUL	14156.0	11000.0	77	100	54				
	APR-JUN	12227.0	9540.0	78	104	54				
COLVILLE RIVER at Kettle Falls	APR-SEP	134.0	114.0	85	130	80				
	APR-JUL	123.0	104.0	85	125	80				
	APR-JUN	114.0	96.0	84	124	84				
KETTLE RIVER nr Laurier	APR-SEP	1829.0	1830.0	100	139	61				
	APR-JUL	1738.0	1740.0	100	139	61				
	APR-JUN	1581.0	1580.0	92	139	61				
COLUMBIA RIVER at Birchbank *	APR-SEP	44675.0	42600.0	95	114	74				
	APR-JUL	35705.0	34100.0	95	114	74				
	APR-JUN	26027.0	24700.0	94	115	75				
COLUMBIA RIVER at Grand Coulee *	APR-SEP	66841.0	60600.0	90	100	74				
	APR-JUL	56169.0	50900.0	90	100	74				
	APR-JUN	44036.0	40100.0	81	100	74				

RESERVOIR STORAGE (1000AF)		WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE THIS YEAR LAST YEAR AVE.	WATERSHED	NO. COURSES AVE.D THIS YEAR AS % OF LAST YR. AVERAGE
ROOSEVELT	5232.0		Colville River	0 0 0
BANKS	715.0		Pend Oreille River	9 63 70
			Kettle River	6 93 91
			Omac Lake, Twin Lakes	0 0 0
			Newman Lake	0 0 0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

OKANOGAN AND METHOW

Mountain snowpack* (inches)



*Based on selected stations

Maximum



Average



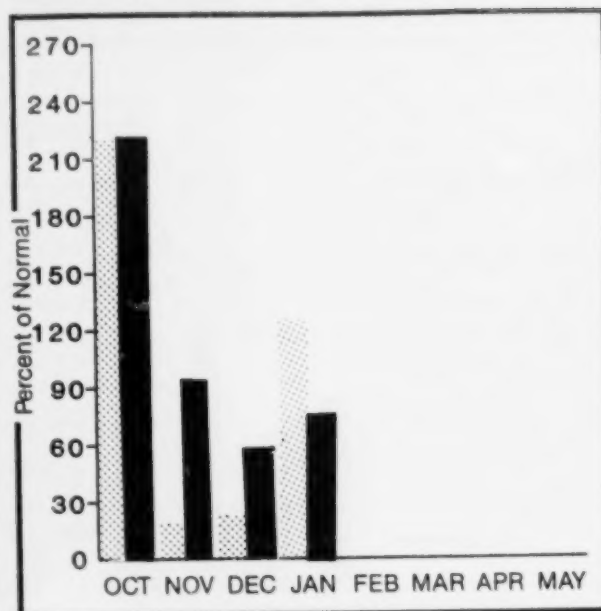
Minimum



Current



Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation



Year to date precipitation



OKANOGAN - METHOW RIVER BASINS

WATER SUPPLY OUTLOOK:

Snowpack on the Okanogan Basin showed improvement in the Canadian portion of the watershed with 112% of February 1 average. The U.S. snow courses were 76% of average. The snow covering the Methow is at 84 % of normal. Forecasted streamflows are 93% on the Okanogan and 94% on the Methow River. January precipitation was 123% of normal raising the water year total to 75% of average. Stream gages were iced in on the Okanogan River. Temperatures averaged 6 degrees above normal. Reservoir storage was 76% of

For more information contact your local Soil Conservation Service office.

OKANOGAN - METHOW RIVER BASINS

STREAMFLOW FORECASTS

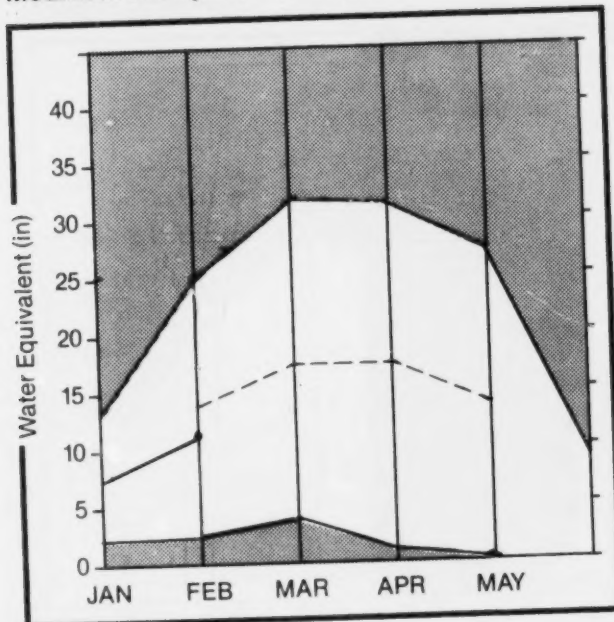
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
STMILKAMEEN R. nr Nighthawk	APR-SEP	1462.0	1370.0	93	146	82				
	APR-JUL	1365.0	1280.0	93	146	82				
	APR-JUN	1161.0	1090.0	93	146	82				
OKANOGAN R. nr Tonasket	APR-SEP	1644.0	1540.0	93	148	80				
	APR-JUL	1497.0	1400.0	93	147	80				
	APR-JUN	1262.0	1180.0	93	147	80				
METHOW RIVER nr Pateros	APR-SEP	980.0	930.0	94	120	84				
	APR-JUL	908.0	860.0	94	120	84				
	APR-JUN	775.0	734.0	94	120	84				

RESERVOIR STORAGE (1000AF)		WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	XX USEABLE STORAGE XX THIS YEAR LAST YEAR AVE.	WATERSHED	NO. COURSES AVE.D THIS YEAR AS % OF LAST YR. AVERAGE
			Okanogan River	22 90 87
			Methow River	2 91 84

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WENATCHEE AND CHELAN

Mountain snowpack* (inches)



*Based on selected stations

Maximum



Average



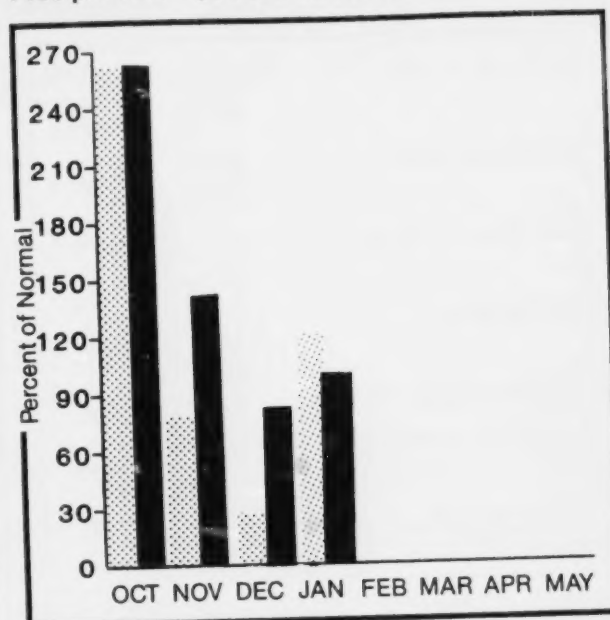
Minimum



Current



Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation



Year to date precipitation



WENATCHEE - CHELAN RIVER BASINS

WATER SUPPLY OUTLOOK:

The percent snow cover increased over the basin improving from the January 1st readings on the Chelan from 75% to 107%, and on the Wenatchee from 74% to 86%. Forecasted streamflow for the April-September period are for 94% on the Chelan, 94% on the Wenatchee, 93% on the Entiat and 94% on the Stimelt. Precipitation was 120% of average for January bringing the water year total to 96% of normal. Streamflows were 81% on the Chelan and 69% on the Wenatchee River. Storage in the Chelan was 60%.

For more information contact your local Soil Conservation Service office.

WENATCHEE - CHELAN RIVER BASINS

STREAMFLOW FORECASTS

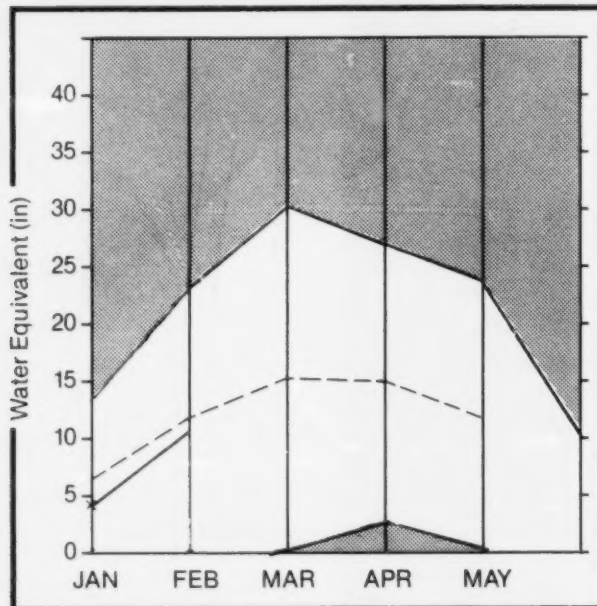
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
CHELAN RIVER at Chelan *	APR-SEP	1203.0	1142.0	94	120	70				
	APR-JUL	1055.0	1000.0	94	120	70				
	APR-JUN	826.0	780.0	94	119	69				
STEHEKIN R. at Stehekin	APR-SEP	860.0	840.0	97	110	70				
	APR-JUL	727.0	710.0	97	110	70				
	APR-JUN	553.0	540.0	97	110	70				
ENTIAI RIVER in Ardenvoir	APR-SEP	234.6	220.0	93						
	APR-JUL	213.0	200.0	93						
	APR-JUN	172.0	160.0	93						
WENATCHEE RIVER at Plain	APR-SEP	1270.0	1200.0	94	120	90				
	APR-JUL	1113.0	1050.0	94	120	60				
	APR-JUN	899.0	850.0	94	120	61				
STEMILT nr Wenatchee (miners in)	MAY-SEP	138.0	131.0	94						
ICICLE CREEK nr Leavenworth	APR-SEP	370.0	330.0	89						
	APR-JUL	340.0	300.0	88						
	APR-JUN	270.0	240.0	88						
COLUMBIA R. bl Rock Island Dam *	APR-SEP	72781.0	67000.0	92	110	74				
	APR-JUL	61601.0	56700.0	92	110	74				
	APR-JUN	48384.0	44500.0	92	110	74				

RESERVOIR STORAGE		(1000AF)	WATERSHED SNOWPACK ANALYSIS					
RESERVOIR	USEABLE CAPACITY	THIS YEAR	LAST YEAR	AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
CHELAN LAKE	676.1	107.2	100.7	100.4	Chelan Lake Basin	3	108	107
					Entiat River	2	140	102
					Wenatchee River	7	83	86
					Colockum Creek	1	109	118
					Squilchuck Creek	1	191	138
					Stemilt Creek	1	105	105

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

YAKIMA

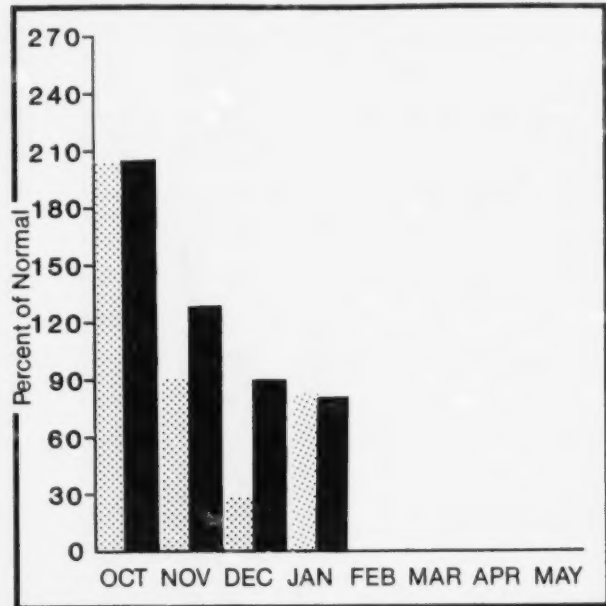
Mountain snowpack* (inches)



*Based on selected stations

Maximum  Average 
Minimum  Current 

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation  Year to date precipitation 

YAKIMA RIVER BASIN

WATER SUPPLY OUTLOOK:

Snow cover improved in the Yakima Basin to 90% of average. Streamflow forecasted for the basin include 89% for the Yakima River at Martin, 90% on the Naches, 90% on the Tieton and 88% on the Ahtanum. Reservoir storage showed minor improvement, but remained at 61% of normal with 441,000 acre feet impounded. January precipitation was 86% of normal with temperatures 2 degrees above average. Streamflow was 40% of normal on the Yakima River.

For more information contact your local Soil Conservation Service office.

YAKIMA RIVER BASIN

STREAMFLOW FORECASTS

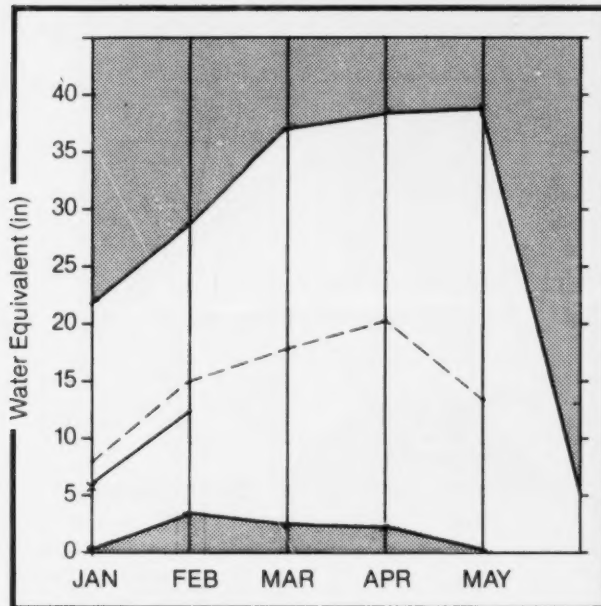
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
YAKIMA RIVER at Martin *	APR-SEP	139.0	125.0	89	106	74				
	APR-JUL	128.0	115.0	89	100	74				
	APR-JUN	111.0	100.0	89	100	74				
YAKIMA RIVER at Cle Elum *	APR-SEP	943.0	785.0	83	96	74				
	APR-JUL	854.0	711.0	83	96	74				
	APR-JUN	734.0	609.0	83	96	74				
YAKIMA RIVER nr Parker *	APR-SEP	2096.0	1760.0	83	106	68				
	APR-JUL	1898.0	1590.0	83	100	68				
	APR-JUN	1667.0	1400.0	83	106	68				
KACHESS RIVER nr Easton *	APR-SEP	121.0	110.0	90	100	77				
	APR-JUL	115.0	100.0	86	101	75				
	APR-JUN	101.0	90.0	89	100	75				
CLE ELUM RIVER nr Roslyn *	APR-SEP	463.0	420.0	90	100	77				
	APR-JUL	422.0	380.0	90	100	75				
	APR-JUN	353.0	320.0	90	100	77				
BUMPING RIVER nr Mile *	APR-SEP	142.0	126.0	88	115	68				
	APR-JUL	129.0	114.0	88	100	68				
	APR-JUN	107.0	95.0	88	110	68				
AMERICAN RIVER nr Mile	APR-SEP	124.0	110.0	88	114	64				
	APR-JUL	113.0	100.0	88	110	64				
	APR-JUN	94.0	85.0	88	114	64				
TIETON RIVER at Tieton *	APR-SEP	246.0	221.0	90	115	68				
	APR-JUL	207.0	190.0	90	117	68				
	APR-JUN	165.0	150.0	90	111	68				
NACHES RIVER nr Naches *	APR-SEP	867.0	751.0	86	115	68				
	APR-JUL	784.0	679.0	86	111	68				
	APR-JUN	667.0	580.0	86	100	68				
AHTANUM CREEK nr Tappan *	APR-SEP	47.0	41.0	86	100	68				
	APR-JUL	43.0	38.0	86	100	68				
	APR-JUN	37.0	33.0	86	100	68				

RESERVOIR STORAGE					(1000AF)	WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF		
		THIS YEAR	LAST YEAR	AVE.			LAST YR.	AVERAGE	
YEECHELUS	157.8	117.4	83.2	96.0	Yakima River	15	110	90	
KACHESS	239.0	187.0	187.0	170.0	Ahtanum Creek	2	130	81	
CLE ELEM	436.9	189.4	175.9	251.0					
BUMPING LAKE	33.7	8.2	3.0	9.0					
RIMROCK	198.0	139.2	92.1	113.0					

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WALLA WALLA

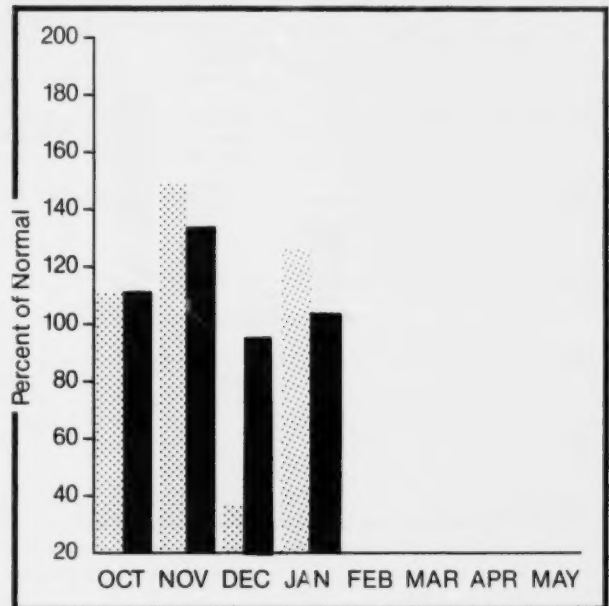
Mountain snowpack* (inches)



*Based on selected stations

Maximum  Average 
Minimum  Current 

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation  Year to date precipitation 

WALLA WALLA RIVER BASIN

WATER SUPPLY OUTLOOK:

Streamflows are expected to be 88% of normal in the Walla Walla River during the spring and summer. January streamflow was at 65% of average. Snow cover is 81% if normal for the February 1 readings. Temperatures in the basins were 7 degrees above normal during January.

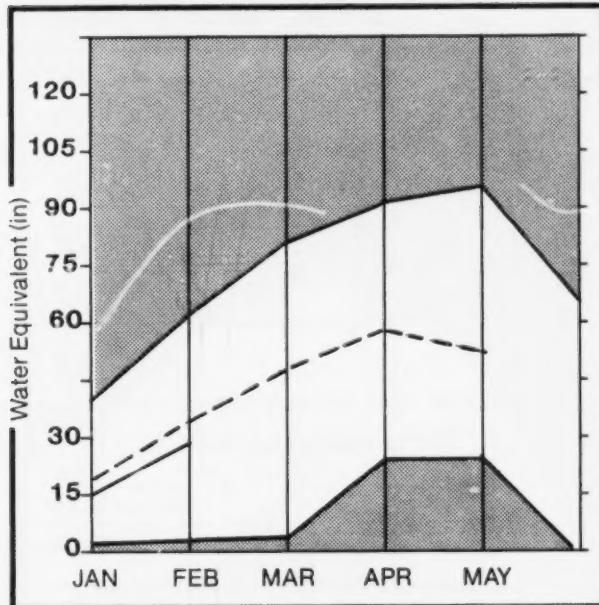
For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS										
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
MILL CREEK at Walla Walla	APR-SEP	17.5	15.1							
	APR-JUL	17.3	14.8							
	APR-JUN	17.1	14.7							
COLUMBIA R. at The Dalles *	APR-SEP	101000.0	88400.0							
	APR-JUL	86500.0	75700.0							
	APR-JUN	70100.0	61700.0							

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

COWLITZ AND LEWIS

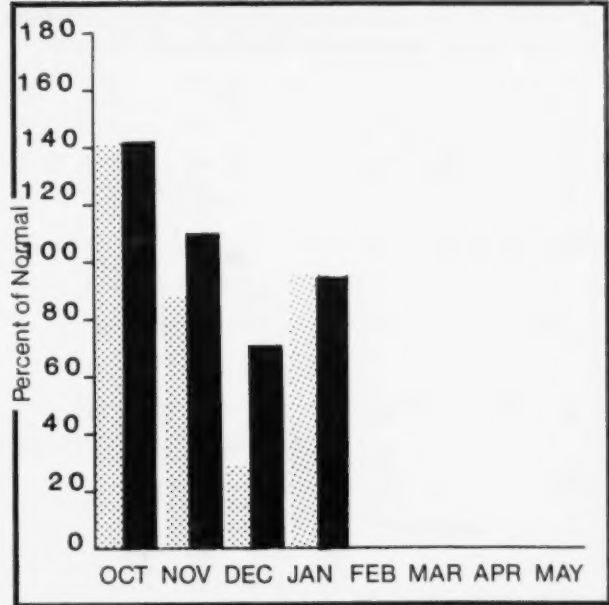
Mountain snowpack* (inches)



*Based on selected stations

Maximum  Average 
 Minimum  Current 

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation  Year to date precipitation 

COWLITZ - LEWIS RIVER BASINS

WATER SUPPLY OUTLOOK:

Streamflow was 80% of January average on the Cowlitz River. Forecasted streamflow are 89% on the Cowlitz and 90% on the Lewis River for the April-September period. Precipitation remained below average in this basin with January having 94% of normal. Temperatures were 4 degrees above average for January. Snow cover in the Cowlitz River Basin was 82% of average and 94% on the Lewis River.

For more information contact your local Soil Conservation Service office.

COWLITZ - LEWIS RIVER BASINS

STREAMFLOW FORECASTS

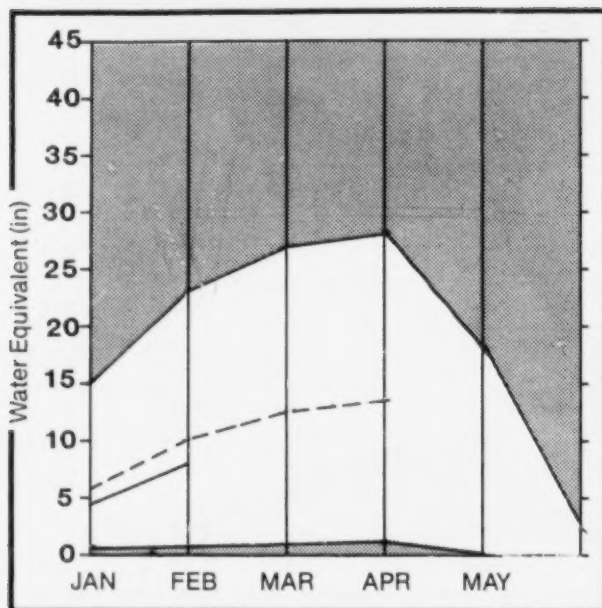
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
LEWIS RIVER at Ariel *	APR-SEP	1249.0	1120.0	90	127	88				
	APR-JUL	1086.0	980.0	90	127	88				
	APR-JUN	961.0	860.0	90	127	88				
COWLITZ R. bl Mayfield Dam *	APR-SEP	2036.0	1930.0	95	221	177				
	APR-JUL	1778.0	1600.0	90	181	140				
	APR-JUN	1502.0	1350.0	90	181	140				
COWLITZ R. at Castle Rock *	APR-SEP	2673.0	2430.0	91	314	250				
	APR-JUL	2323.0	2110.0	91	314	250				
	APR-JUN	1980.0	1800.0	91	314	250				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	THIS YEAR	USEABLE STORAGE LAST YEAR	AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE
					Cowlitz River	1	85 82
					Lewis River	4	83 74

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WHITE - GREEN

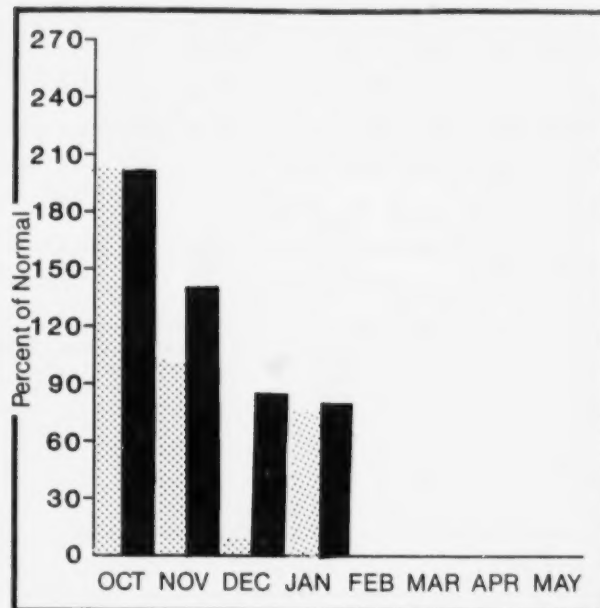
Mountain snowpack* (inches)



*Based on selected stations

Maximum  Average 
Minimum  Current 

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation  Year to date precipitation 

WHITE - GREEN RIVER BASINS

WATER SUPPLY OUTLOOK:

Snow cover on the Green River Basin was at 61% of normal for the February 1st snow survey. Streamflows are forecasted to be 76% of normal for the April-September period. Temperatures averaged 6 degrees above normal for January. Streamflows were near average for January with precipitation at 71% of normal. The water year precipitation is at 81% of average. Heavy rain on January 18 established new 24 hour precipitation records at some recording stations, and caused some local flooding.

For more information contact your local Soil Conservation Service office.

WHITE - GREEN RIVER BASINS

STREAMFLOW FORECASTS

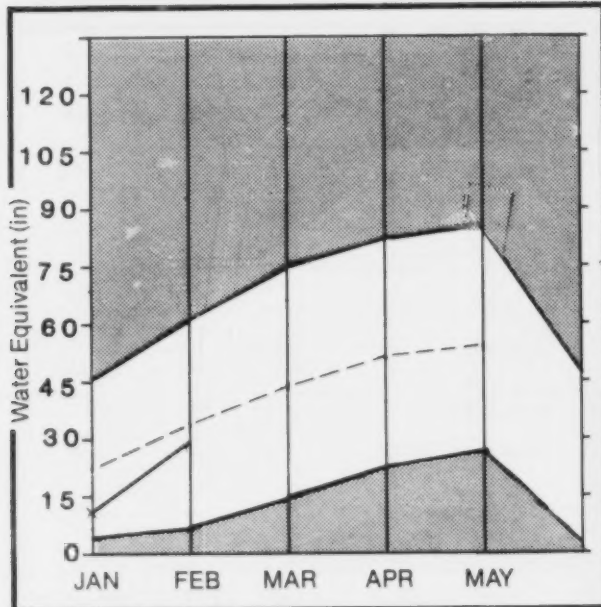
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
GREEN RIVER bl Howard Hanson Dam *	APR-SEP	316.0	246.0	77						
	APR-JUL	284.0	218.0	76						
	APR-JUN	256.0	190.0	74						
CEDAR RIVER nr Cedar Falls	APR-SEP	93.0	84.0	90						

RESERVOIR STORAGE (1000AF)				WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE THIS YEAR	USEABLE STORAGE LAST YEAR	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	% OF AVERAGE
				White River	2	111	84
				Green River	9	50	41

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

NORTH PUGET SOUND

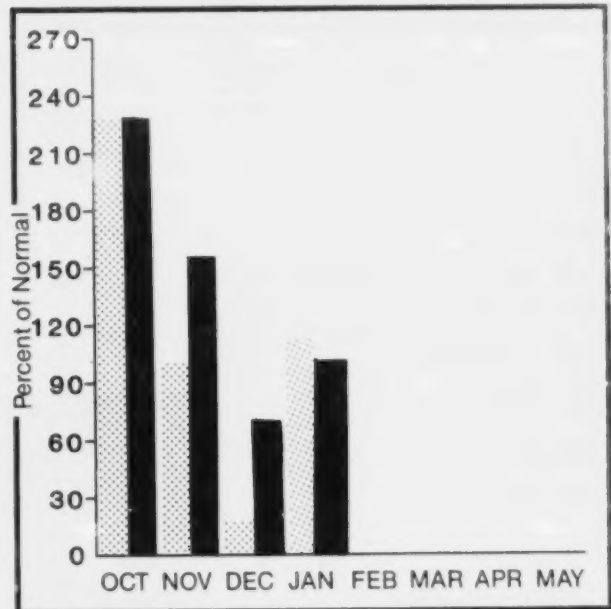
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

NORTH PUGET SOUND RIVER BASINS

WATER SUPPLY OUTLOOK:

Snow cover improved in the Skagit Basin going from 78% for January 1st to 91% for February 1. Stream-flows are forecasted to be 87% of normal for the April-September period. Precipitation was 111% of normal for January bringing the water year total to 100%. Temperatures were 6 degrees above average for January. Some areas of local floodig occurred during the January 18 rain storm.

For more information contact your local Soil Conservation Service office.

NORTH PUGET SOUND RIVER BASINS

STREAMFLOW FORECASTS

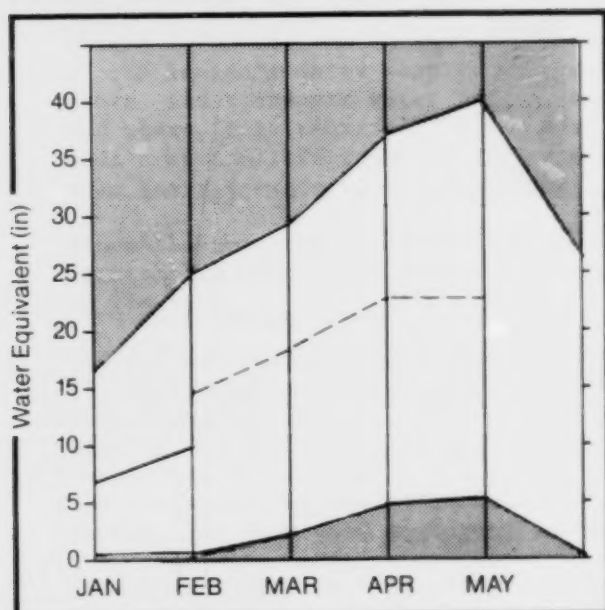
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	R. AS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SKAGIT RIVER at Newhalem *	APR-SEP	2356.0	1070.0	45	110	44				
	APR-JUL	1972.0	1740.0	88	110	44				
	APR-JUN	1485.0	1300.0	87	110	44				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **	THIS YEAR	LAST YEAR	WATERSHED	NO. COURSES AVE. D	THIS YEAR AS % OF LAST YR. AVERAGE
PODS	1104.1	955.7	889.5	1033.7	Skagit River	10	105 90
DIADLO RESERVOIR	90.6	86.0	84.2	84.2	Baker River	0	0 0
GORGE RESERVOIR	9.8	7.1	8.8	7.1	Cedar River	0	0 0
					Snoqualmie River	0	0 0
					Skylomin River	2	71 70

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-90 period.

OLYMPIC

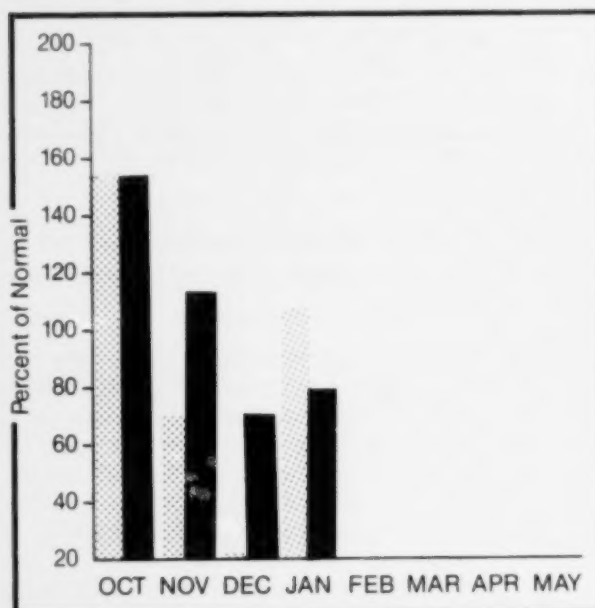
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

OLYMPIC PENINSULA RIVER BASINS

WATER SUPPLY OUTLOOK:

Snow cover in the Olympic Basin remained much the same as the January report, with the Dungeness 75% and the Elwah 60% of normal. Forecasted streamflows are 78% on the Dungeness and 74% on the Elwah for the April-September period. Some local flooding occurred during the rainfall of January 18. Precipitation for January was 105% of normal, bringing the water year total to 79% of average. Temperatures for January were 6 degrees above normal.

For more information contact your local Soil Conservation Service office.

OLYMPIC PENINSULA RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
DUGENESS RIVER nr Sequim	APR-SEP	160.0	125.0							
	APR-JUL	130.0	100.0							
	APR-JUN	97.0	76.0							
ELWHA RIVER nr Port Angeles	APR-SEP	553.0	410.0							
	APR-JUL	454.0	340.0							

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE THIS YEAR	USEABLE STORAGE LAST YEAR	USEABLE STORAGE AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE
					Dugeness River	1	71
					Morse Creek	1	91
					Elwha River	1	77

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

SNOW SURVEYS

Water is the lifeblood of the West--the crucial commodity. The region's development from a thousand years ago to today has been tied to the availability of water.

Water supply varies greatly from season to season and from year to year, and water is often located great distances from where it is needed. Snowmelt from winter accumulations in the high mountains is the source of about 70 percent of the region's water supply. Typically, irrigators and communities collect, store, and transport water to regulate quantity and ensure availability when and where it is required. With about 40 million acres under irrigation, modern agriculture together with the pressures of a rapidly expanding society make heavy demands on this water.

Since the development of new supplies has become extremely costly and not feasible in many cases, conservation of existing water resources is critical to the West.

Early westerners realized the ties between the size of the winter snowpack in the high mountain ranges--Rockies, Cascades, Sierra Nevada--and their summer water supply. Some attempts to measure the snow and predict runoff had been made in the East as early as 1834, but it wasn't until 1904 that a systematic survey was undertaken in the West. Dr. James Church, a classics professor at the University of Nevada in Reno, made surveys on Mt. Rose in the Sierra Nevada. He developed measuring equipment and sampling techniques that led to the first water supply forecasts. Success in Nevada soon spread to other states and agencies. By 1935, at last nine independent snow surveys were being conducted.

Drought is a part of life in the West. In 1934, a particularly severe drought resulted in farmers demanding better predictions of the streamflows available for growing crops. Others who counted on water for industry, power generation, and domestic use echoed this request. Congress responded in 1935 by passing legislation creating a federal snow survey and water supply forecasting program under the direction of the Bureau of Agricultural Engineering in the Department of Agriculture. In 1939, the bureau was transferred to the Soil Conservation Service (SCS); this agency continues to direct a cooperative federal, state, and private snow survey program. The National Weather Service is a major cooperator with SCS in making these water supply forecasts. Today, forecasts are routinely issued for over 600 locations in the West.

Manual surveys, similar to those initiated by Dr. Church and performed by teams of trained surveyors, have been the backbone of the measurement network. With the advent of mechanized oversnow machines and aircraft, the surveyor's task has been eased somewhat, but snowshoes and skis are still required to reach many remote sites. Periodic measurements at some 1400 snow courses provide the insight into snowpack accumulation patterns. Forecasters still use this information advantageously, but more frequent data are needed to improve the accuracy and timeliness of forecasts. Various methods of remote data acquisition have been tested, including conventional line-of-sight radio telemetry, satellite based telemetry, and a new technique called meteor burst telemetry.

Meteor burst telemetry relies on the physical phenomenon that enables radio signals to be reflected off ionized meteorite trails 50-75 miles above the earth's surface. Utilizing this principle, sites as far apart as 1200 miles can communicate with one another for very short periods ranging from fractions of seconds up to several seconds. This interval is sufficiently long to "burst" relatively short data messages between sending and receiving stations. This method of communications is ideally suited for interrogating remote data sites on a schedule of several polls per day. The interference that mountains often cause in conventional communications is not a problem for a meteor burst system.

In 1977, SCS began modernizing its snow surveys by introducing meteor burst technology for acquiring snowpack data. The project, called SNOTEL (for SNOW TELEmetry) measures and transmits snowpack, precipitation, and temperature on a daily basis throughout the West. A snow pillow serves as a hydraulic weighting platform to measure the snow water content.

About 550 SNOTEL sites are in operation. Most sites are powered by solar panels and are visited only a few times each year. Data are transmitted daily by meteor burst to a master station in Boise, Idaho, or Ogden, Utah, and then automatically forwarded by telephone to a central computer in Portland, Oregon.

Hydrologic data gathered from the SNOTEL system, snow course network, and other climatological stations are assembled in the computer system at the West National Technical Center in Portland, Oregon, for analysis and interpretation. A series of computer programs, known collectively as the Centralized Forecasting System (CFS), is the analytical tool used to generate streamflow forecasts, data summaries, and narratives that describe the current water supply outlook. This information is made immediately available to over 300 SCS field offices and other interested users through dial-up telecommunications.

Water supplies are no longer a mystery thanks to this systematic snowpack inventory and monitoring program and advanced computer technology. Managers are alerted early in the water year to expect normal flows, water shortages, or floods, and they can make plans while there is still time to take effective action. Snow surveys and water supply forecasting do not create water, but they do the next best thing: They provide the tools for conservation of this most precious of the West's resources. For more information on this program, contact your local conservation district or SCS office.

All programs and services of the USDA
are available to everyone without regard
to race, creed, color, sex, age, handicap
or national origin.

The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

- Canada:** Ministry of the Environment, Water
Investigations Branch, Victoria, British Columbia
- States:** Washington State Department of Ecology
Washington State Department of Natural Resources
- Federal:** Department of the Army
Corps of Engineers
U.S. Department of Agriculture
Forest Service
U.S. Department of Commerce
NOAA, National Weather Service
U.S. Department of the Interior
Bonneville Power Administration
Bureau of Reclamation
Geological Survey
National Park Service
- Local:** City of Tacoma
City of Seattle
Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company
Snohomish County P.U.D.
- Private:** Okanogan Irrigation District
Wenatchee Heights Irrigation District
Newman Lake Homeowners Association

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ROOM 360, U.S. COURT HOUSE
SPOKANE, WASHINGTON 99201

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300

THIRD-CLASS BULK RATE
POSTAGE AND FEES PAID
USDA - SCS
SPOKANE, WA
PERMIT NO G-267

THIRD CLASS MAIL

Washington Water Supply Outlook

and

Federal — State — Private
Cooperative Snow Surveys



SOIL CONSERVATION SERVICE

☆ GPO 1983 696-712

986/3



United States
Department of
Agriculture

Soil
Conservation
Service

Spokane,
Washington



Washington Water Supply Outlook

March 1, 1986



A 57.46/7:

Foreword

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado (New Mexico)	2490 West 26th Ave., Denver, CO 80211
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	50 South Virginia Street, Third Floor, Reno, NV 89505
Oregon	1220 Southwest 3rd Ave., 16th Floor, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82602

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 95802; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Saskatchewan, and N.W.T. — The Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta, T3C 1A6.

Washington Water Supply Outlook

and

**Federal — State — Private
Cooperative Snow Surveys**

Issued by

Wilson **Scaling**
Chief
Soil Conservation Service
Washington, D.C.

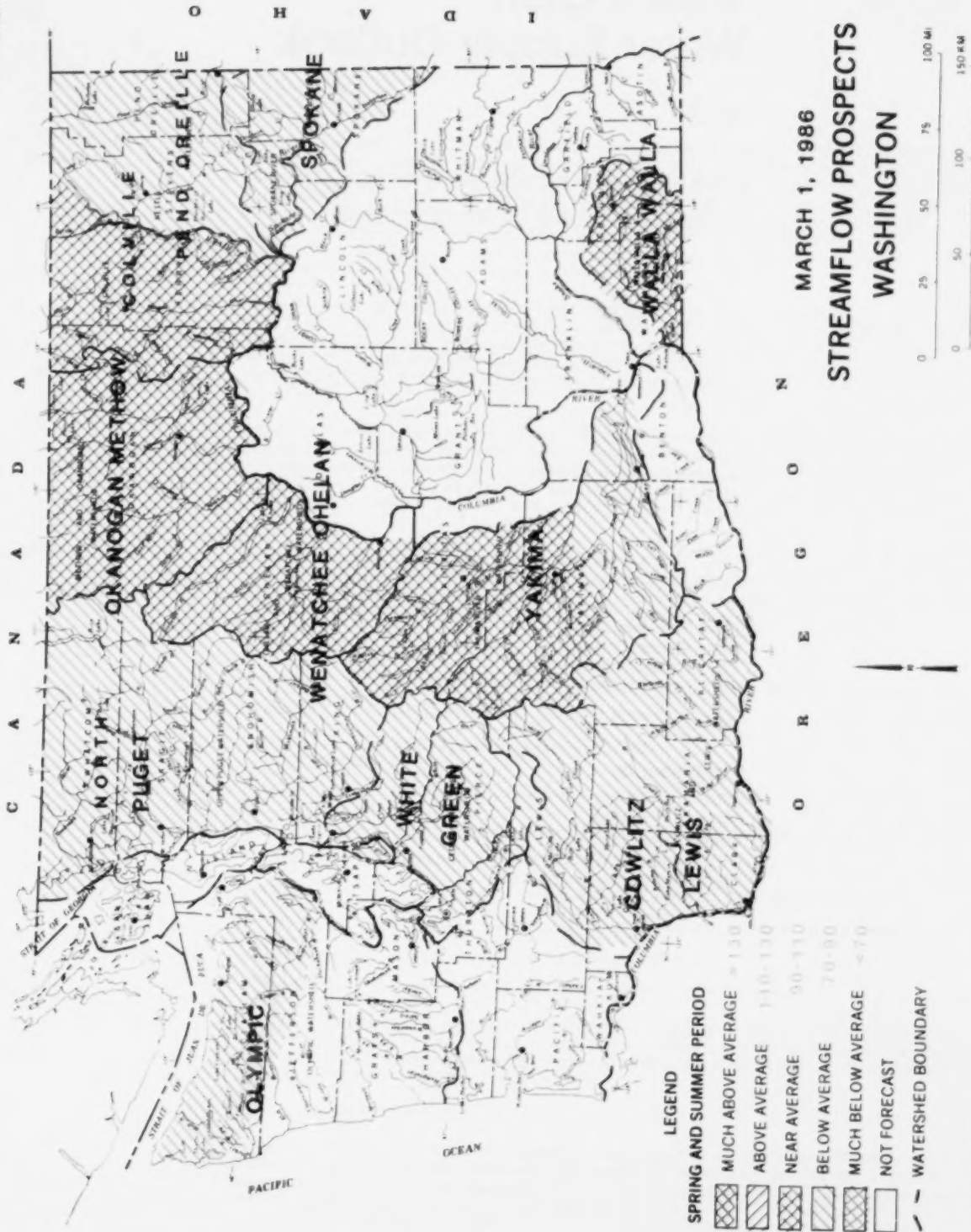
Released by

Lynn A. Brown
State Conservationist
Soil Conservation Service
Spokane, Washington

Prepared by

William F. Weller
Water Supply Specialist
Room 360 U.S. Courthouse
Spokane, Washington 99201

All programs and services of the USDA
are available to everyone without regard
to race, creed, color, sex, age, handicap
or national origin.



SOURCE: Data compiled by SCS
Field Personnel

GENERAL OUTLOOK

SUMMARY:

The snowpack for March 1 is below average except for parts of Wenatchee, Chelan and the Walla Walla drainages. February precipitation was above average. Spring like temperatures were felt statewide during February. The above normal precipitation and near normal temperature had streamflow at or above normal statewide. Reservoir storage showed some improvement statewide. Forecasted stream flows are slightly improved over February.

SNOWPACK:

March 1 snowpack was varied over Washington with a high of 125% on the Stemilt Creek drainage, and a low of 43% of normal on the Cedar River. The Yakima Basin snowpack is at 87% of average, while the Spokane, Okanogan and Pend Oreille Basins are near 80%. Snowpack around Mt. St. Helens is near 77% of normal. The Puget Sound rivers of the Elwah, Snoqualmie and Baker are below 70% of average.

PRECIPITATION:

February precipitation was above average for all the basins in the state. Highest was the Walla Walla Basin where 292% of normal fell during the month. The Walla Walla weather station reported 4.12 inches compared to the February average of 1.41. The Wenatchee Basin had 180% of normal precipitation. The lowest was the Olympic Basin where precipitation was 115% of average. Other basin readings were; Spokane 129%, Okanogan 152% Yakima 134%, Cowlitz-Lewis 127% and the North Puget Sound 128%.

RESERVOIRS:

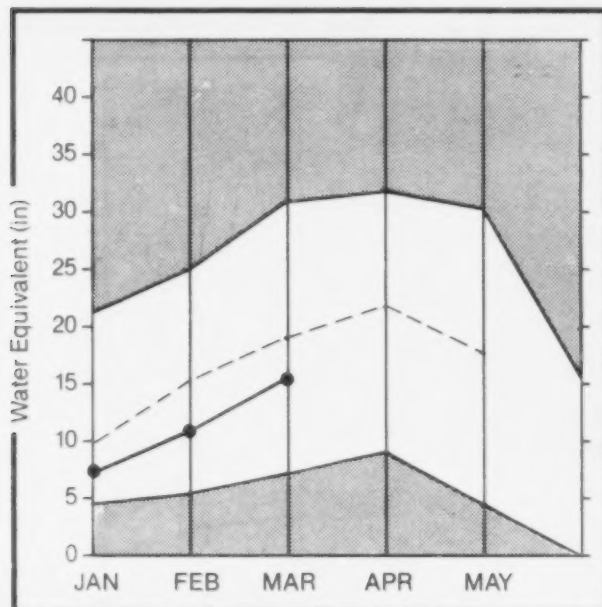
Reservoir storage improved during February, with the Puget Sound reservoirs at 97% of normal and Chelan Lake at 101% of average. The Yakima reservoirs remain below normal at 80%, storing 555,200 acre feet compared to the average of 697,000 acre feet. The Okanogan reservoirs are at 104% of normal.

STREAMFLOW

February streamflow was above normal over most of Washington. Above normal precipitation coupled with above average temperatures allowed much of the low elevation snow to melt. Some February streamflows around the state were; Spokane 102%, Columbia @ the International Boundary 107%, Chelan 114%, Wenatchee 126%, Yakima 96%, Walla Walla 193%, Cowlitz 136% and the Skykomish 159%. Forecasted streamflows for the coming summer are for near average on the eastern side and for below average for western Washington.

SPOKANE

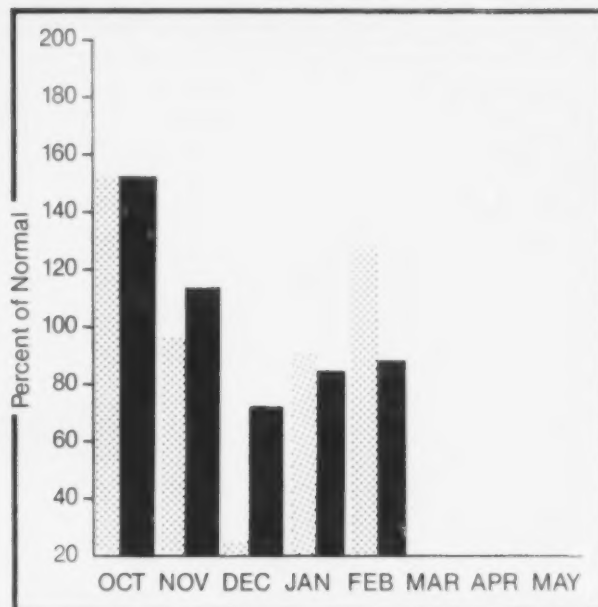
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average
Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

SPOKANE RIVER BASIN

WATER SUPPLY OUTLOOK:

Snowcover in the Spokane Drainage is 81% of normal for the March 1st measurements. This is up from the 69% for February. February Precipitation was 129% of average, bringing the water year total to 87%. Streamflows are forecasted to be 70% of normal for the summer. Above average precipitation and normal temperatures combined to bring melt to the low elevation snowpack. Streamflow in the Spokane River was 102% of normal at Post Falls. Storage in Coeur d'Alene Lake increased to 129% of normal.

For more information contact your local Soil Conservation Service office.

SPOKANE RIVER BASIN

STREAMFLOW FORECASTS

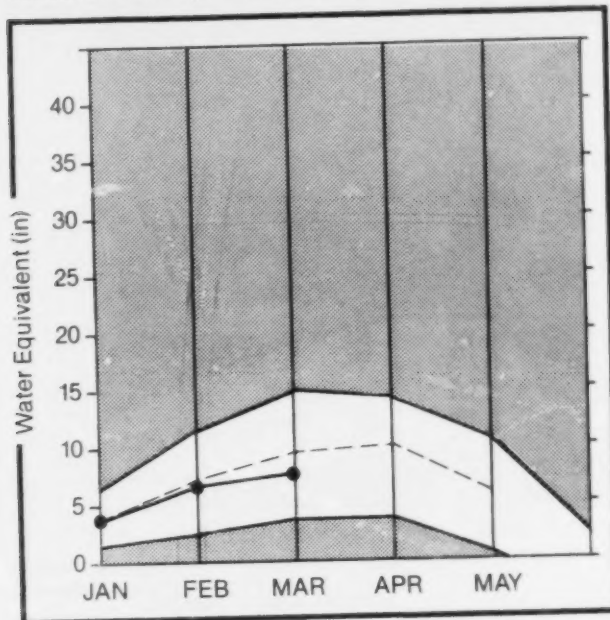
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SPOKANE at Post Falls	APR-SEP APR-JUL	2848.0 2754.0	2000.0 1930.0	70 70	100 100	80 80				

RESERVOIR STORAGE		(1000AF)			WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE	THIS YEAR	LAST YEAR	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE
COEUR D'ALENE	225.1	125.0	17.0	142.0	Spokane River	17	65 76

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

COLVILLE AND PEND OREILLE

Mountain snowpack* (inches)



*Based on selected stations

Maximum



Average



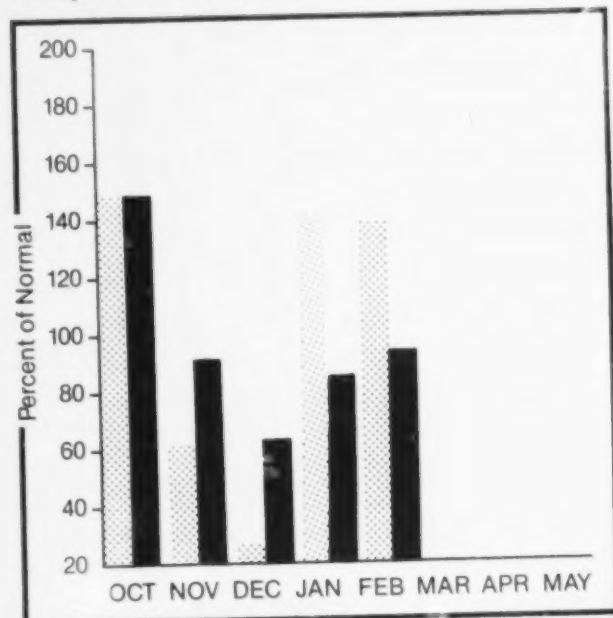
Minimum



Current



Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation



Year to date precipitation



COLVILLE - PEND OREILLE RIVER BASINS

WATER SUPPLY OUTLOOK:

Snowcover improved on the Pend Oreille River from 70% to 78% of normal, but reduced in the Kettle from 95% to 84% and Colville from 85% to 78%. February precipitation was 139% of normal. Streamflows were 114% of average in the Pend Oreille and 134% in the Kettle River. Forecasted streamflows are for 82% in the Pend Oreille, 90% in the Kettle and 80% in the Colville. Streamflows in the Columbia River were at 107% of normal for February and are forecasted to be 93% for the spring and summer.

For more information contact your local Soil Conservation Service office.

COLVILLE - PEND OREILLE RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
PEND OREILLE RIVER bl Box Canyon	APR-SEP	15425.0	12600.0	81	101	63				
	APR-JUL	14156.0	11600.0	81	101	63				
	APR-JUN	12227.0	10100.0	82	102	64				
COLVILLE RIVER at Kettle Falls	APR-SEP	134.0	107.0	79	129	31				
	APR-JUL	123.0	100.0	81	130	33				
	APR-JUN	114.0	93.5	82	131	33				
KETTLE RIVER nr Laurier	APR-SEP	1829.0	1650.0	90	122	58				
	APR-JUL	1738.0	1560.0	89	122	58				
	APR-JUN	1581.0	1440.0	91	123	59				
COLUMBIA RIVER at Birchbank *	APR-SEP	44605.0	44300.0	99	118	80				
	APR-JUL	35705.0	35500.0	99	118	80				
	APR-JUN	26027.0	25770.0	99	118	80				
COLUMBIA RIVER at Grand Coulee *	APR-SEP	66841.0	62200.0	93	106	80				
	APR-JUL	56169.0	52300.0	93	106	80				
	APR-JUN	44036.0	41000.0	93	106	80				

RESERVOIR STORAGE

(1000AF)

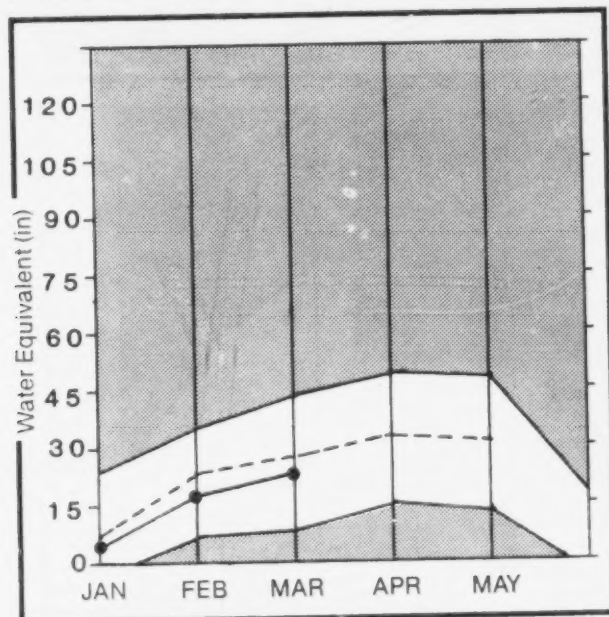
WATERSHED SNOWPACK ANALYSIS

RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE THIS YEAR	USEABLE STORAGE LAST YEAR	USEABLE STORAGE AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	% OF AVERAGE
ROOSEVELT	5232.0	4860.7	2694.0	2763.0	Colville River	3	78	78
BANKS	715.0	741.4	674.8	606.0	Pend Oreille River	12	75	79
					Kettle River	9	102	83
					Omac Lake, Twin Lakes	0	0	0
					Newman Lake	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

OKANOGAN AND METHOW

Mountain snowpack* (inches)



*Based on selected stations

Maximum



Average



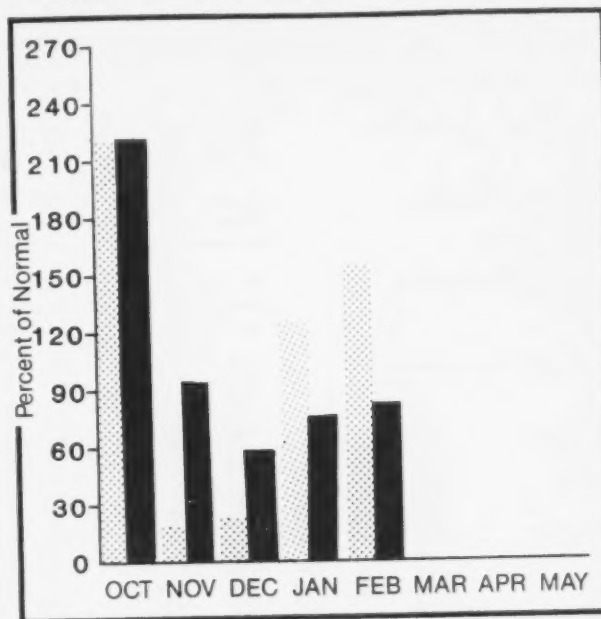
Minimum



Current



Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation



Year to date precipitation



OKANOGAN - METHOW RIVER BASINS

WATER SUPPLY OUTLOOK:

Precipitation in the Okanogan-Methow Basins was 152% of normal during February. Temperatures averaged degree above normal for the month. Snowcover was 83% of average on the Okanogan and 79% on the Methow River drainages. Reservoir storage is at 104% of the 20 year average, with 14,500 acre feet in storage. Forecasted streamflow for the Okanogan is 95% and on the Methow is 96% of normal.

For more information contact your local Soil Conservation Service office.

OKANOGAN - METHOW RIVER BASINS

STREAMFLOW FORECASTS

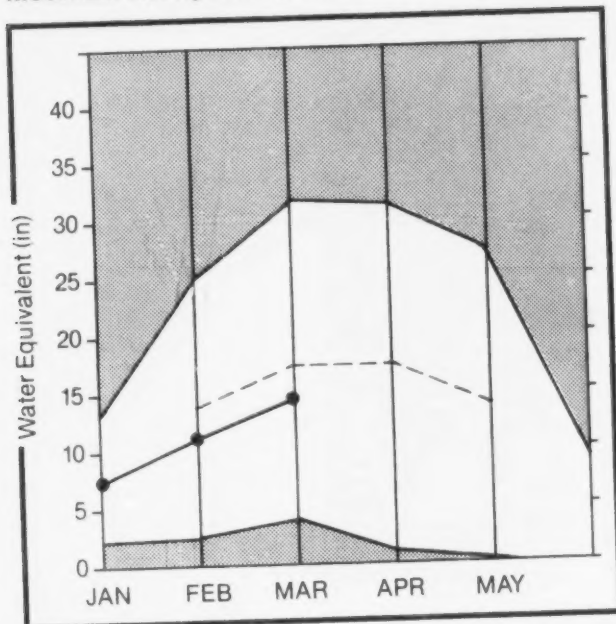
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SIMILKAMEEN R. nr Nighthawk	APR-SEP	1462.0	1400.0	95	126	81				
	APR-JUL	1365.0	1310.0	95	126	66				
	APR-JUN	1161.0	1130.0	97	127	67				
OKANOGAN R. nr Tonasket	APR-SEP	1644.0	1560.0	94	129	61				
	APR-JUL	1497.0	1420.0	94	129	61				
	APR-JUN	1262.0	1210.0	95	130	62				
METHOW RIVER nr Pateros	APR-SEP	980.0	936.0	95	126	64				
	APR-JUL	908.0	865.0	95	125	65				
	APR-JUN	773.0	745.0	96	126	66				

RESERVOIR STORAGE (1000AF)		WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **	WATERSHED	NO. COURSES AVE.D
	THIS YEAR	LAST YEAR AVE.		
			Okanoan River	20
			Methow River	4

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WENATCHEE AND CHELAN

Mountain snowpack* (inches)



*Based on selected stations

Maximum



Average



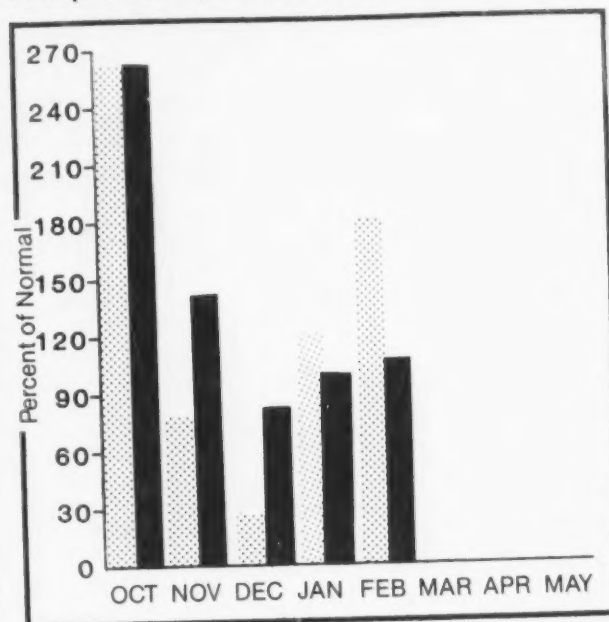
Minimum



Current



Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation



Year to date precipitation



WENATCHEE - CHELAN RIVER BASINS

WATER SUPPLY OUTLOOK:

Snowcover remained near the season norm with 103% in the Chelan, 96% in the Entiat and 91% for the Wenatchee Basin. Precipitation for February was 180% of normal, with Lake Wenatchee reporting 8.1 inches compared to an average of 3.38. February streamflow was above average with the Wenatchee at 126% and the Chelan at 114%. Storage in Chelan Lake was at 101% of the March 1st normal. Forecasted streamflow for the spring and summer are Chelan 98%, Entiat 95%, Wenatchee 95% and the Stemilt 95%.

For more information contact your local Soil Conservation Service office.

WENATCHEE - CHELAN RIVER BASINS

STREAMFLOW FORECASTS

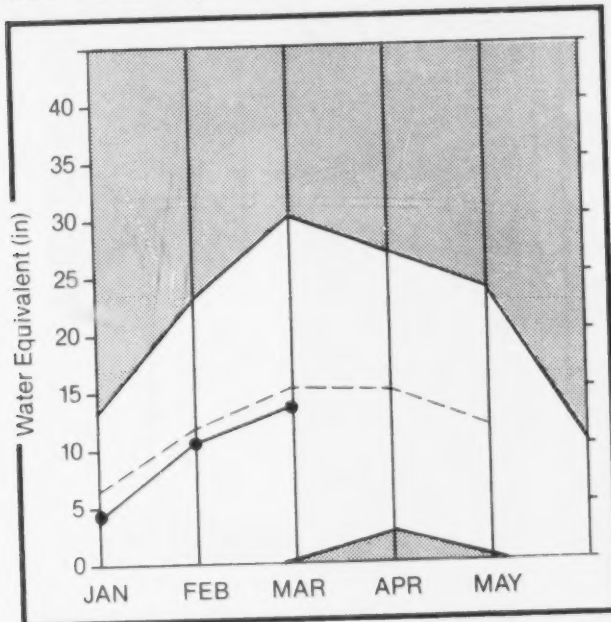
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
CHELAN RIVER at Chelan *	APR-SEP	1203.0	1180.0	98	117	71				
	APR-JUL	1055.0	1030.0	97	117	71				
	APR-JUN	826.0	810.0	98	117	71				
STEHEKIN R. at Stehekin	APR-SEP	860.0	860.0	100	113	87				
	APR-JUL	727.0	727.0	100	113	87				
	APR-JUN	553.0	560.0	101	113	87				
ENTIAT RIVER nr Ardenvoir	APR-SEP	234.8	222.0	94						
	APR-JUL	113.0	202.0	64						
	APR-JUN	172.0	165.0	95						
WENATCHEE RIVER at Plain	APR-SEP	1270.0	1240.0	97	130	64				
	APR-JUL	1113.0	1070.0	97	130	64				
	APR-JUN	899.0	890.0	98	131	67				
STEMILT nr Wenatchee (miners in)	MAY-SEP	138.0	132.0	95						
ICICLE CREEK nr Leavenworth	APR-SEP	370.0	350.0	94						
	APR-JUL	340.0	325.0	95						
	APR-JUN	270.0	262.0	97						
COLUMBIA R. b1 Rock Island Dam *	APR-SEP	72781.0	58000.0	79	110	80				
	APR-JUL	61601.0	58300.0	94	110	80				
	APR-JUN	46284.0	45900.0	98	110	80				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE
		THIS YEAR	LAST YEAR	AVE.			
CHELAN LAKE	376.1	220.0	137.7	---	Chelan Lake Basin	6	125
					Entiat River	2	128
					Wenatchee River	7	98
					Columbia Creek	1	89
					Squitchuck Creek	1	141
					Stemilt Creek	1	120

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

YAKIMA

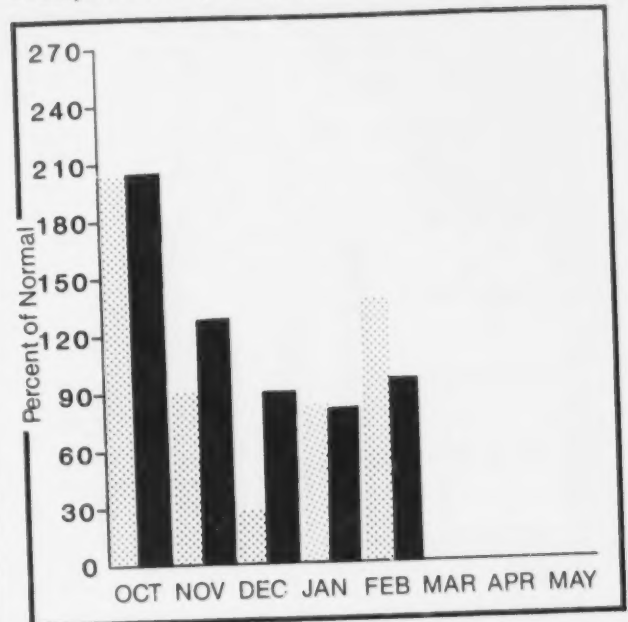
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

YAKIMA RIVER BASIN

WATER SUPPLY OUTLOOK:

Snowcover remained constant with 87% of average over the Yakima Basin. Streamflows are forecasted to be 91% on the Yakima and 95% on the Naches River. Precipitation for February was 134% of normal, with late month precipitation falling as rain. Reservoir storage is 80% of the 20 year average, with 560,000 acre feet in storage. Temperatures averaged 1 degree below average, with the last two weeks being above normal. Streamflow in the Yakima for February was 96% of average.

For more information contact your local Soil Conservation Service office.

YAKIMA RIVER BASIN

STREAMFLOW FORECASTS

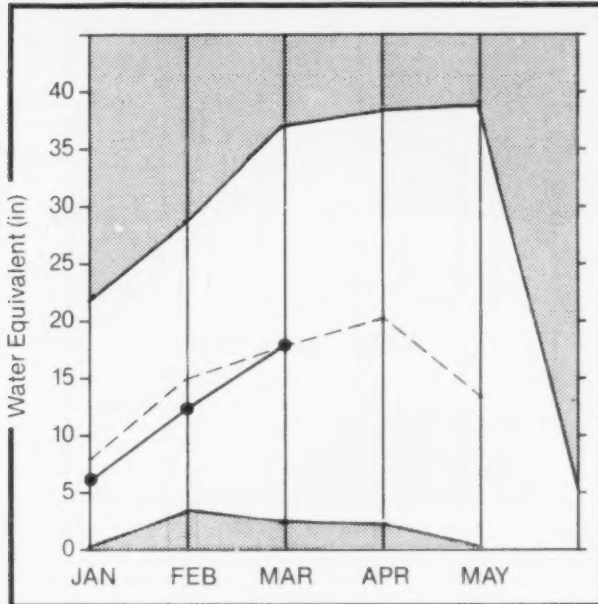
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
YAKIMA RIVER at Martin *	APR-SEP	139.0	126.0	90	102	79				
	APR-JUL	128.0	116.0	90	102	79				
	APR-JUN	111.0	102.0	91	103	80				
YAKIMA RIVER at Cle Elum *	APR-SEP	943.0	849.0	90	101	77				
	APR-JUL	854.0	770.0	90	101	77				
	APR-JUN	734.0	670.0	91	102	80				
YAKIMA RIVER nr Parker *	APR-SEP	2096.0	1940.0	92	112	84				
	APR-JUL	1898.0	1760.0	92	112	84				
	APR-JUN	1667.0	1570.0	94	113	85				
KACHESS RIVER nr Easton *	APR-SEP	121.0	109.0	90	100	77				
	APR-JUL	115.0	104.0	90	102	77				
	APR-JUN	101.0	92.0	91	103	80				
CLE ELUM RIVER nr Roslyn *	APR-SEP	463.0	426.0	92	100	81				
	APR-JUL	422.0	390.0	92	100	81				
	APR-JUN	353.0	330.0	93	100	82				
DUMPING RIVER nr Mile *	APR-SEP	142.0	135.0	95	115	78				
	APR-JUL	129.0	123.0	95	115	78				
	APR-JUN	107.0	103.0	96	117	78				
AMERICAN RIVER nr Mile	APR-SEP	124.0	118.0	95	115	78				
	APR-JUL	113.0	107.0	94	113	77				
	APR-JUN	94.0	90.0	95	117	78				
TIETON RIVER at Tieton *	APR-SEP	246.0	237.0	96	112	75				
	APR-JUL	207.0	198.0	95	117	75				
	APR-JUN	165.0	160.0	96	118	76				
KACHES RIVER nr Naches *	APR-SEP	867.0	823.0	94	112	72				
	APR-JUL	784.0	744.0	94	118	72				
	APR-JUN	667.0	640.0	95	119	73				
AHTANUM CREEK nr Tangle *	APR-SEP	47.0	38.0	80	119	42				
	APR-JUL	43.0	34.8	80	119	42				
	APR-JUN	37.0	30.3	81	117	43				

RESERVOIR STORAGE (1000AF)		WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE THIS YEAR LAST YEAR AVE.	WATERSHED	NO. COURSES AVE.D THIS YEAR AS % OF LAST YR. AVERAGE
KECHELUS	157.8	157.8	Yakima River	15 107 86
KACHESS	239.0	239.0	Ahtanum Creek	2 139 71
CLE ELEM	436.9	436.9		
DUMPING LAKE	13.7	13.7		
RIMROCK	198.0	198.0		

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WALLA WALLA

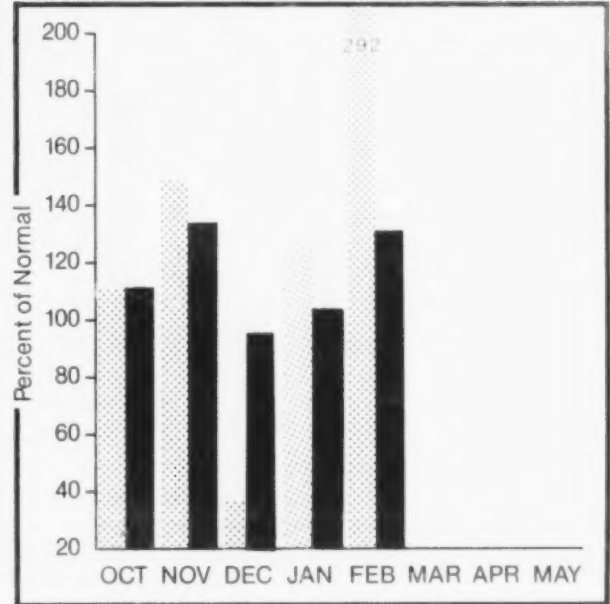
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average
Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

WALLA WALLA RIVER BASIN

WATER SUPPLY OUTLOOK:

Streamflow in the Walla Walla River was 193% of normal for February. Precipitation for February was 292% of average, with temperatures normal for the month. Temperatures were above average for the last two weeks of February and along with the high precipitation caused much of the low elevation snow to melt. Streamflows are forecasted to be near normal with the Walla Walla River at 96% for the summer.

For more information contact your local Soil Conservation Service office.

WALLA WALLA RIVER BASIN

STREAMFLOW FORECASTS

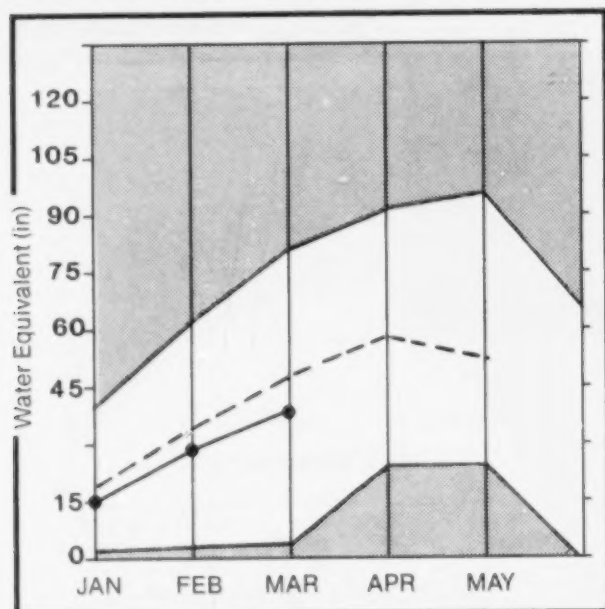
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
MILL CREEK at Walla Walla	APR-SEP	17.5	16.8	94	126	69				
	APR-JUL	17.3	16.6	95	127	69				
	APR-JUN	17.1	16.5	96	122	70				
COLUMBIA R. at The Dalles *	APR-SEP	101000.0	95000.0	94	111	77				
	APR-JUL	86500.0	81100.0	93	111	77				
	APR-JUN	70100.0	65900.0	94	111	77				

RESERVOIR STORAGE (1000AF)				WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	THIS YEAR	USEABLE STORAGE LAST YEAR AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	% OF AVERAGE
				Mill Creek	1	58	102

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

COWLITZ AND LEWIS

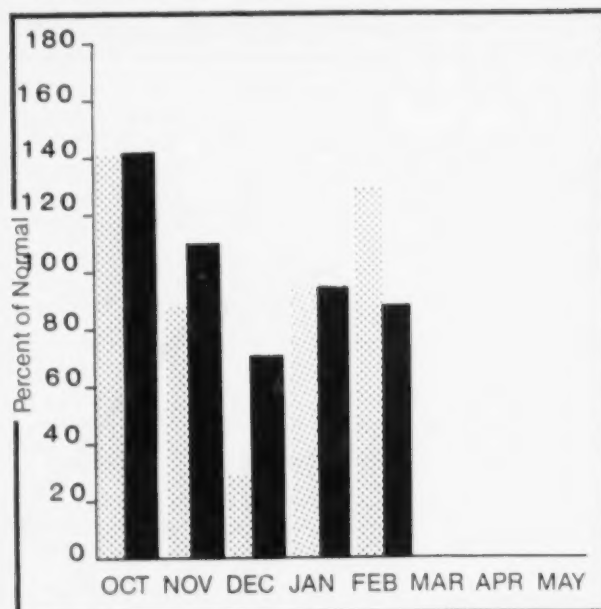
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average
Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

COWLITZ - LEWIS RIVER BASINS

WATER SUPPLY OUTLOOK:

Streamflows are forecasted to be 85% on the Cowlitz River and 84% on the Lewis River this summer. February streamflow on the Cowlitz River was 136% of normal. Snowcover for the March 1st snow measurements were at 77% of normal down from the 94% of normal for February 1. Precipitation for February was 127% of average, with much of it falling as rain. Temperatures for the month were near normal.

For more information contact your local Soil Conservation Service office.

COWLITZ - LEWIS RIVER BASINS

STREAMFLOW FORECASTS

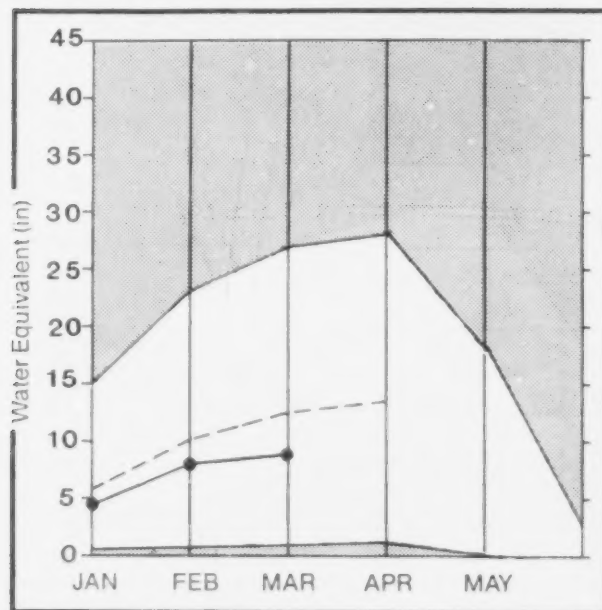
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
LEWIS RIVER at Ariel *	APR-SEP	1249.0	1050.0							
	APR-JUL	1086.0	912.0							
	APR-JUN	961.0	820.0							
COWLITZ R. bl Mayfield Dam *	APR-SEP	2038.0	1670.0							
	APR-JUL	1779.0	1460.0							
	APR-JUN	1502.0	1250.0							
COWLITZ R. at Castle Rock *	APR-SEP	2673.0	2270.0							
	APR-JUL	2323.0	1975.0							
	APR-JUN	1980.0	1710.0							

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	THIS YEAR	USEABLE STORAGE LAST YEAR	AVERAGE	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	% OF AVERAGE
					Cowlitz River	2	105	74
					Lewis River	2	82	90

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WHITE - GREEN

Mountain snowpack* (inches)



*Based on selected stations

Maximum



Average



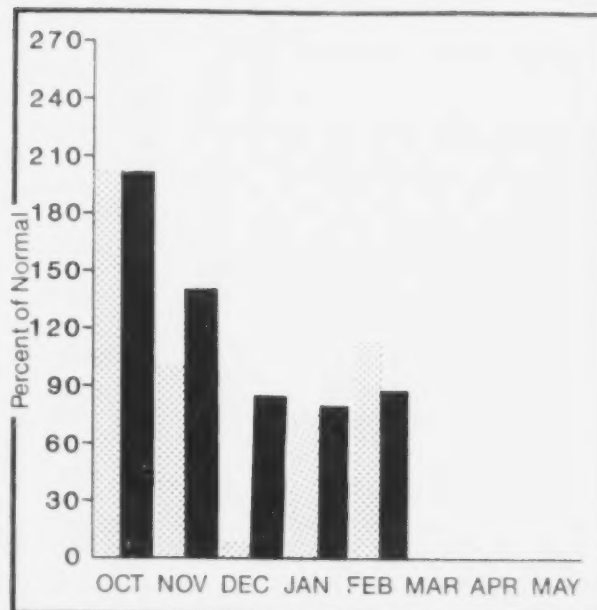
Minimum



Current



Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation



Year to date precipitation



WHITE - GREEN RIVER BASINS

WATER SUPPLY OUTLOOK:

Snowcover continued to be below average in the Green and Cedar Rivers with 66% and 43% of normal. The White River is only slightly better with 85% of average. Streamflows were above average for February and the forecasted streamflows are 80% for the Green River and 83% for the Cedar River. Precipitation for February was 116% of normal, with temperatures near average for the month.

For more information contact your local Soil Conservation Service office.

WHITE - GREEN RIVER BASINS

STREAMFLOW FORECASTS

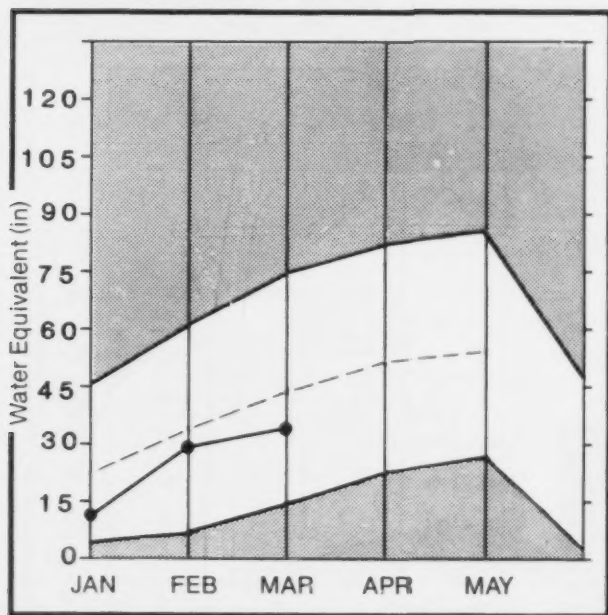
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
GREEN RIVER bl Howard Hanson Dam *	APR-SEP	316.0	255.0							
	APR-JUL	284.0	230.0							
	APR-JUN	256.0	210.0							
CEDAR RIVER nr Cedar Falls	APR-SEP	93.0	77.0							

RESERVOIR STORAGE (1000AF)				WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE	USEABLE STORAGE	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF	
	THIS YEAR	LAST YEAR	AVE.			LAST YR.	AVERAGE
				White River	2	112	77
				Green River	9	47	64

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

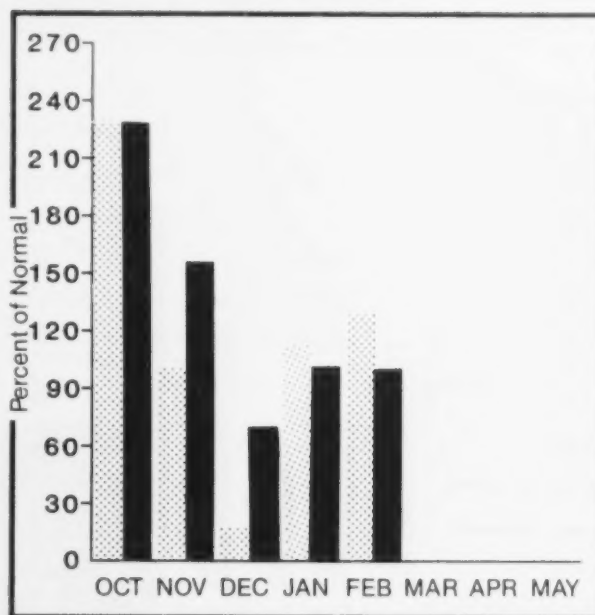
NORTH PUGET SOUND

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum Average
Minimum Current

Monthly precipitation Year to date precipitation

NORTH PUGET SOUND RIVER BASINS

WATER SUPPLY OUTLOOK:

Snowcover remained much the same as last month with the Skagit River at 90% of average and the Baker River at 66%. Streamflows are forecasted to be 85% of average on the Skagit. February precipitation was 128% of normal for the North Puget Sound, with Diablo Dam receiving 11.87 inches for the month. Streamflow for February was 159% of average for the Skykomish River. Reservoir storage in Ross, Diablo and Gorge was at 97% of normal.

For more information contact your local Soil Conservation Service office.

NORTH PUGET SOUND RIVER BASINS

STREAMFLOW FORECASTS

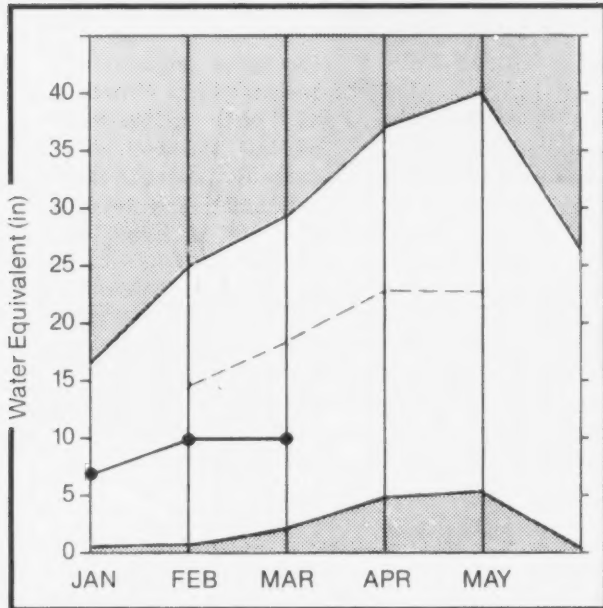
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SKAGIT RIVER at Newhalem *	APR-SEP	2356.0	2000.0	84	163	67				
	APR-JUL	1972.0	1680.0	85	163	67				
	APR-JUN	1485.0	1270.0	85	164	68				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	THIS YEAR	LAST YEAR	AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE	
ROSS	1404.1	107.7	107.3	107.5	Skagit River	14	101	91
DIABLO RESERVOIR	90.6	80.0	80.0	80.0	Baker River	9	64	63
CORGE RESERVOIR	9.8	7.8	7.7	7.75	Cedar River	2	32	43
					Snoqualmie River	1	89	82
					Skykomish River	2	74	72

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

OLYMPIC

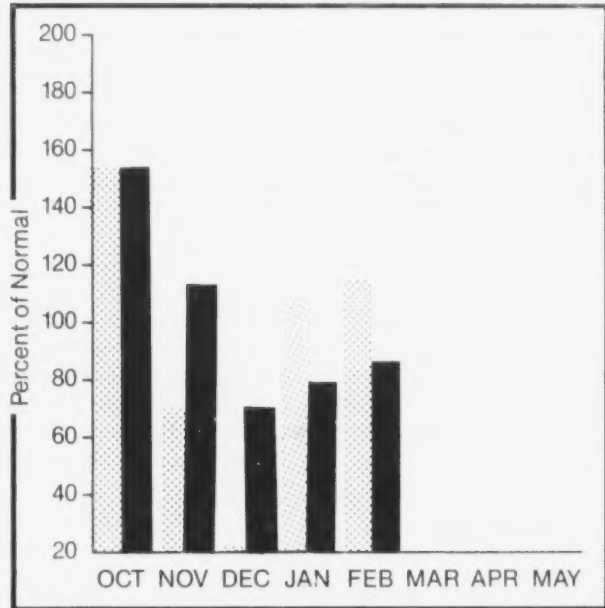
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average
Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

OLYMPIC PENINSULA RIVER BASINS

WATER SUPPLY OUTLOOK:

Snowcover in the Olympic Peninsula remained much below average, with the Elwa at 50%, the Dungeness at 64% and Morse Creek at 78%. Streamflows are forecasted to be 75% of normal for the summer. Precipitation was 115% of normal for February with the Quillayute Airport having 12.27 inches of moisture. The water year total is now 86% of normal up from 79% last month.

For more information contact your local Soil Conservation Service office.

OLYMPIC PENINSULA RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
DUNGENESS RIVER nr Sequia	APR-SEP	160.0	120.0	75	75	57				
	APR-JUL	130.0	97.5	75	75	57				
	APR-JUN	97.0	72.8	75	75	57				
ELWHA RIVER nr Port Angeles	APR-SEP	253.0	414.0	75	75	57				
	APR-JUL	454.0	340.0	75	75	57				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE	LAST YEAR	AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE
	THIS YEAR	LAST YEAR					
					Dungeness River	1	60 64
					Horse Creek	1	70 70
					Elwha River	1	55 50

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

RESERVOIR OPERATION MANAGEMENT PROGRAM

The Soil Conservation Service can develop a Reservoir Operation and Management plan for cooperators with the Soil Conservation Districts in Washington. If you are operating a reservoir for irrigation water supply, power generation or other use this may be of some value to you.

Selecting appropriate storage and release rates for reservoirs in snowmelt runoff environments is a prerequisite to sound water management. A significant number of small impoundments, operated for single or multiple purpose use in the Western United States, lack adequate management tools to guide this process each year. A methodology has been developed and approved to use seasonal volume forecasts issued by Soil Conservation Service to improve management capability at many of these reservoirs.

The technique involves generating a family of simple rule curves for each forecast period. These curves permit operators to use predicted inflow volume to set target outflow rates that will enable them to reach a full reservoir after passage of the seasonal peak. Forecasts at three probability levels help establish the range of likely seasonal runoff events. The rule curves provide an operational tool useful for developing effective water management plans for reservoirs where forecast information is available.

Snow Survey data can be obtained by calling one of the following local SCS offices:

PULLMAN PMC

Office (509) 335-7376
Farm (509) 335-9689

OLYMPIA, Area I

Area Office	FTS	434-9454 or 9455
Chehalis	(206)	748-0083
Kelso	(206)	425-1880
Lake Stevens	FTS	392-9259
Lynden	(206)	354-5658
Montesano	(206)	249-5900
Mt. Vernon	(206)	424-5153
Olympia FO	FTS	434-9448
Port Angeles	FTS	396-4277
Port Orchard	(206)	876-5529
Puyallup	(206)	845-5533
Raymond	(206)	942-5945
Renton	FTS	399-3325 or 3326
Vancouver	FTS	422-7631

EPHRATA, AREA II

Area Office	FTS	446-4374 or 4375
Davenport	(509)	725-4181 or 725-1345
Ephrata FO	FTS	446-4385
Moses Lake	(509)	765-3261
Okanogan	(509)	422-2750
Othello	(509)	488-2802
Ritzville	(509)	659-0254
Waterville	(509)	745-8362
Wenatchee	FTS	390-0242 or 0260

YAKIMA, AREA III

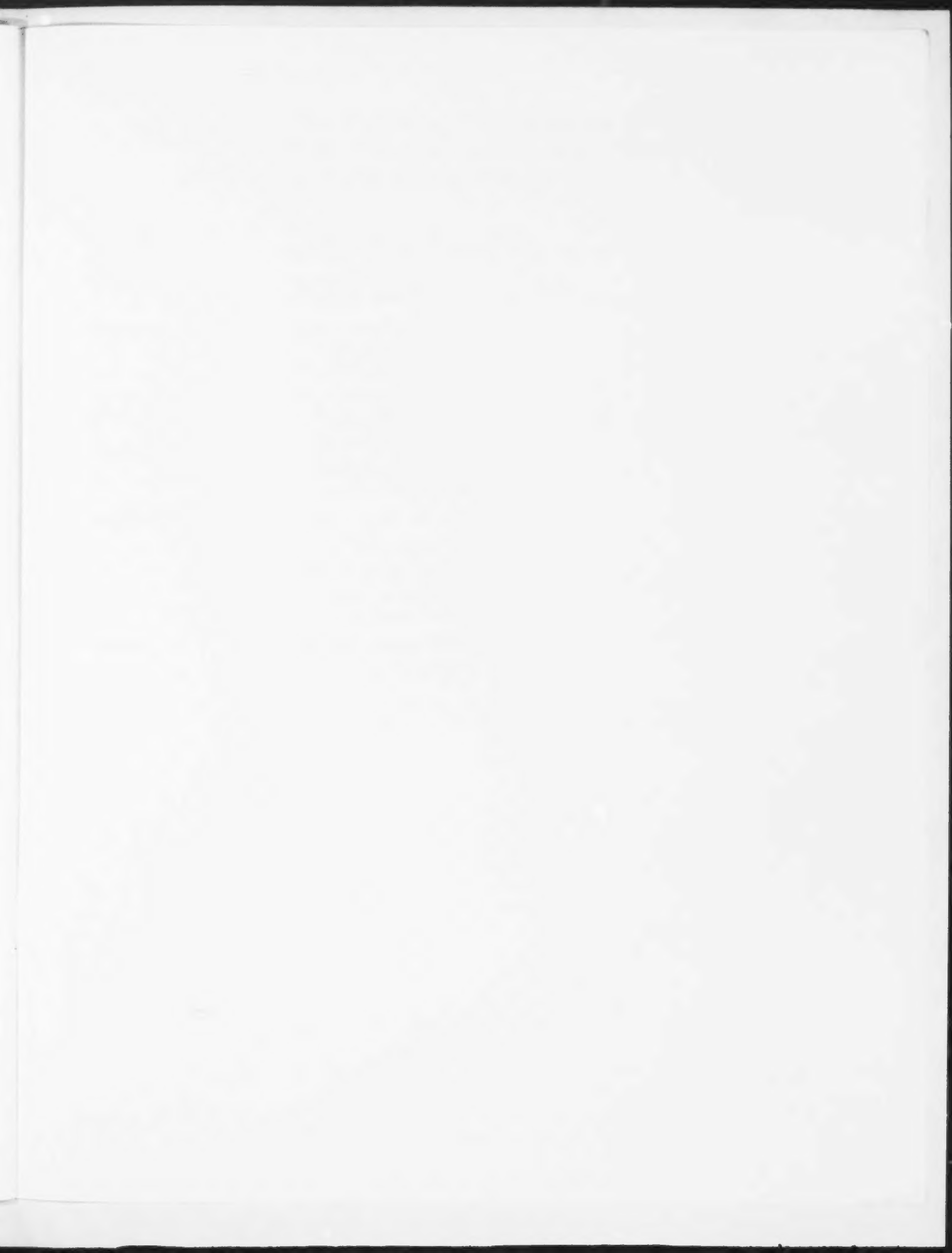
Area Office	FTS	446-5865 or 5866
Ellensburg	(509)	925-5375
Goldendale	(509)	773-5823
Pasco	(509)	545-8546 or 8547
Prosser	(509)	786-1923
Sunnyside	(509)	837-7911
Toppenish	(509)	865-4012
Walla Walla	FTS	434-6340
White Salmon	(509)	493-1936
Yakima FO	FTS	446-5909

SPOKANE, AREA IV

Area Office	FTS	439-3726
Cheney	(509)	458-6200, Ext 2309
Clarkston	(509)	758-8012
Colfax	(509)	397-4636
Colville	(509)	684-5067
Dayton	(509)	382-2351
Fairfield	(509)	283-2331
Newport	(509)	447-4217
Pomeroy	(509)	843-1998
Republic	(509)	775-3473
Spokane FO	FTS	439-2120

SOIL SURVEY OFFICES

Bellingham	(206)	676-3520
Inchelium	(509)	722-4395
Nespelem	FTS	439-9431
Wapato	(509)	877-4004



The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

- Canada:** Ministry of the Environment, Water
Investigations Branch, Victoria, British Columbia
- States:** Washington State Department of Ecology
Washington State Department of Natural Resources
- Federal:** Department of the Army
Corps of Engineers
U.S. Department of Agriculture
Forest Service
U.S. Department of Commerce
NOAA, National Weather Service
U.S. Department of the Interior
Bonneville Power Administration
Bureau of Reclamation
Geological Survey
National Park Service
- Local:** City of Tacoma
City of Seattle
Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company
Snohomish County P.U.D.
- Private:** Okanogan Irrigation District
Wenatchee Heights Irrigation District
Newman Lake Homeowners Association

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ROOM 360, U.S. COURT HOUSE
SPOKANE, WASHINGTON 99201

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300

THIRD-CLASS BULK RATE
POSTAGE AND FEES PAID
USDA - SCS
SPOKANE, WA
PERMIT NO G-267

THIRD CLASS MAIL

**Washington
Water Supply Outlook**

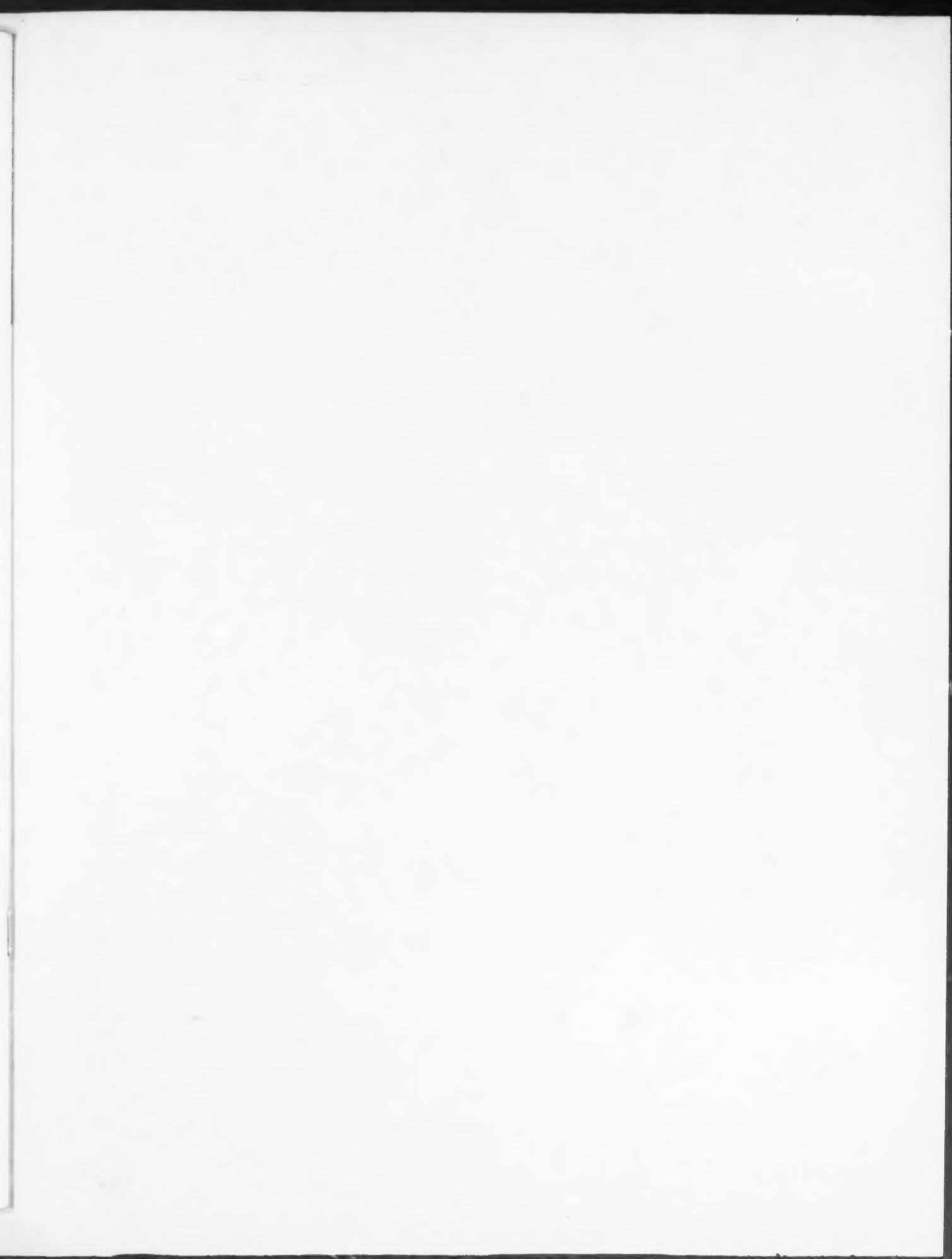
and

Federal — State — Private
Cooperative Snow Surveys



SOIL CONSERVATION SERVICE

☆ GPO 1983 696-712



READEX best copy available
FICHE

986/4



United States
Department of
Agriculture

Soil
Conservation
Service

Spokane,
Washington



Washington Water Supply Outlook

April 1, 1986

MAY 6 1986

U. S. GOVT. PRINTING
DEPOSITORY



A57.46/7:

Foreword

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado (New Mexico)	2490 West 26th Ave., Denver, CO 80211
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	50 South Virginia Street, Third Floor, Reno, NV 89505
Oregon	1220 Southwest 3rd Ave., 16th Floor, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82602

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 95802; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Saskatchewan, and N.W.T. — The Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta, T3C 1A6.

Washington Water Supply Outlook

and

**Federal — State — Private
Cooperative Snow Surveys**

Issued by

Wilson Scaling
Chief
Soil Conservation Service
Washington, D.C.

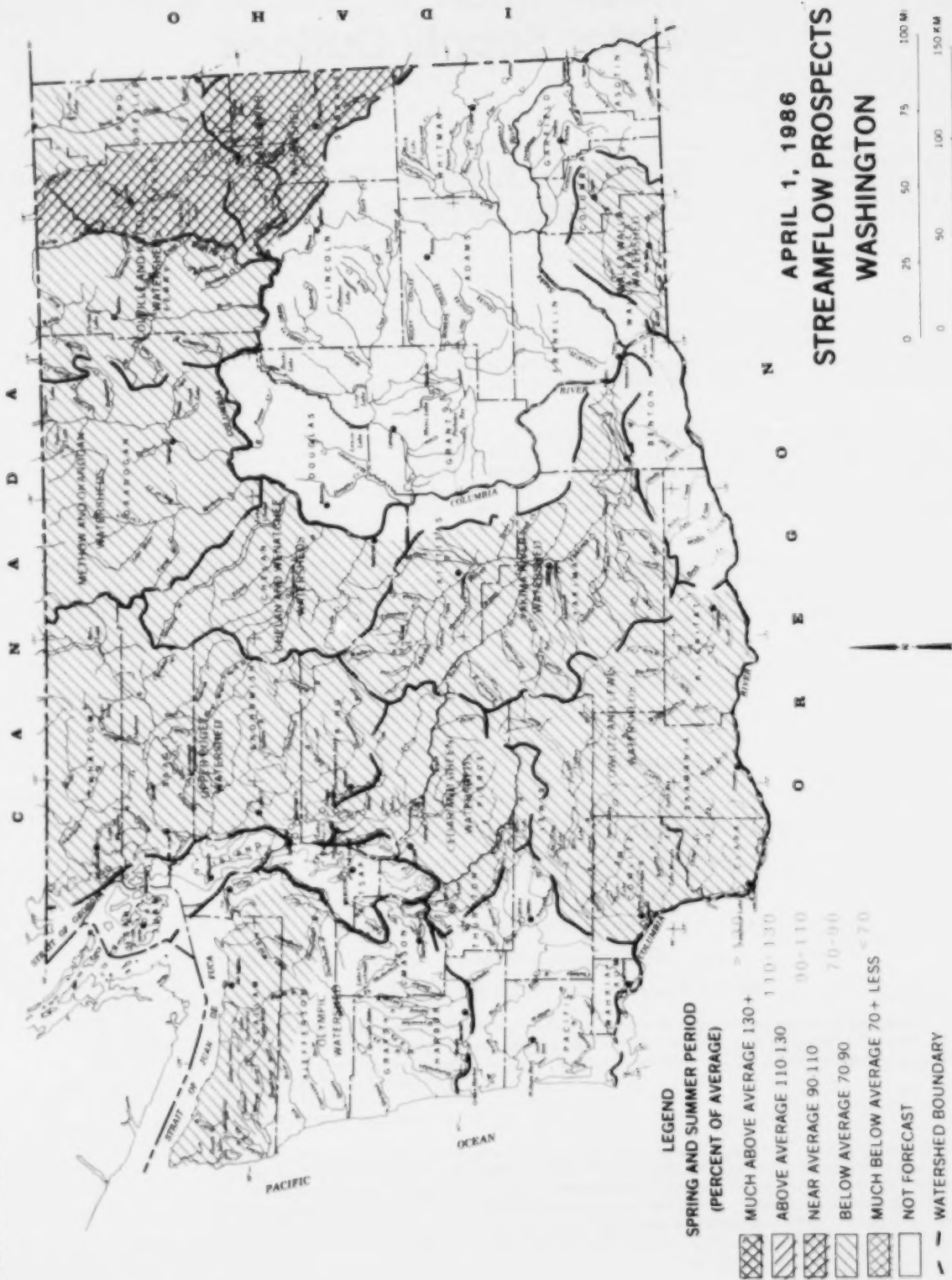
Released by

Lynn A. Brown
State Conservationist
Soil Conservation Service
Spokane, Washington

Prepared by

William F. Weller
Water Supply Specialist
Room 360 U.S. Courthouse
Spokane, Washington 99201

All programs and services of the USDA
are available to everyone without regard
to race, creed, color, sex, age, handicap
or national origin.



GENERAL OUTLOOK

SUMMARY:

Spring snowmelt occurred over most of Washington State during March. Streamflow was above normal in most of the major rivers. With the added streamflow, reservoir storage improved with the Yakima reservoirs going from 80% of normal to 92% of average. Temperatures were above average during March. Precipitation was near normal to slightly below normal in all sections of Washington except Walla Walla which was much above average. Streamflows are forecasted to be below normal over Washington for the coming summer months.

SNOWPACK:

The Stemilt Drainage near Wenatchee is the only area of Washington with above average snowpack. The rest of the state is below average to much below average. Snowpack on the Olympic Basin is the lowest in the state with 33% of normal on the Elwah River and 43% on the Dungeness. Other readings in the Puget Basins include; 56% on the Baker River, 77% on the Skagit, 67% on the Skykomish and 45% on the Green River. Some East side snowpacks; Yakima 71%, Wenatchee 69%, Chelan 91%, Okanogan 78%, Pend Oreille 68% and the Spokane River at 58%.

PRECIPITATION:

Precipitation varied over Washington during March, with 186% of average in the Walla Walla to 65% of normal in the Wenatchee drainage. The Walla Walla weather station now has 139% of normal precipitation for the water year to date. Most east side basins were slightly below normal with the following; Spokane 97%, Colville 85%, Okanogan 96% and the Yakima 75%. Some west side basins include the Cowlitz at 79%, the Green River 101%, the north Puget Sound 89% and the Olympic 102%.

RESERVOIRS:

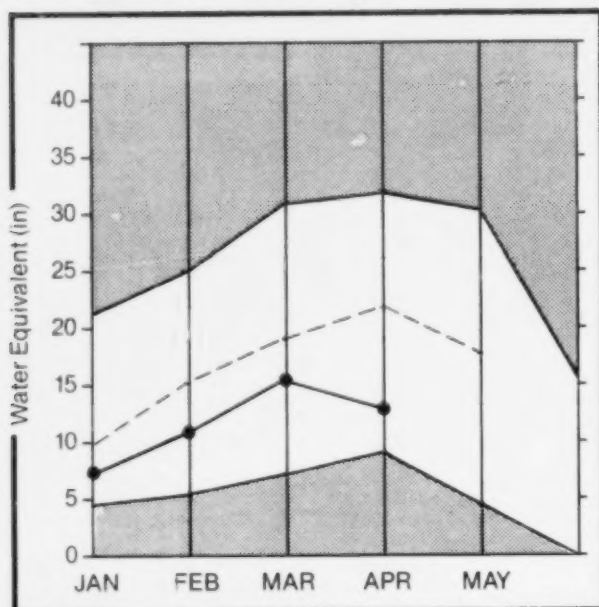
The April 1 reservoir storage shows improvement over the March 1 amounts with the greatest improvement being storage in the Yakima Basin. April 1 storage in the Yakima was 677,400 acre feet or 92% of normal. Capacity for the five major Yakima reservoirs is 1,065,000 acre feet. Chelan Lake is 143% of April 1 average storage and 45% of capacity, holding 302,400 acre feet. Coeur d' Alene Lake is at 99% of capacity. Roosevelt is at 84% of capacity and 278% of the April 1 average. Ross Reservoir is at 67% of capacity and 314% of the April 1 normal storage.

STREAMFLOW:

Streamflows in March were above average in all streams except the Chehalis River, which was 69% of normal. Warm weather with temperatures averaging five degrees above normal and rain brought spring melt nearly one month early to Washington State. Many of the streams were in excess of 200% of normal March runoff with the following; Kettle River 240%, Similkameen 260%, Chelan 211%, Pend Oreille 215%, Wenatchee 230% and the Snake River below Ice Harbor dam 227%. The Columbia River below Grand Coulee was 180% of normal. Streamflows for the summer are forecasted to be below normal for all areas of Washington.

SPOKANE

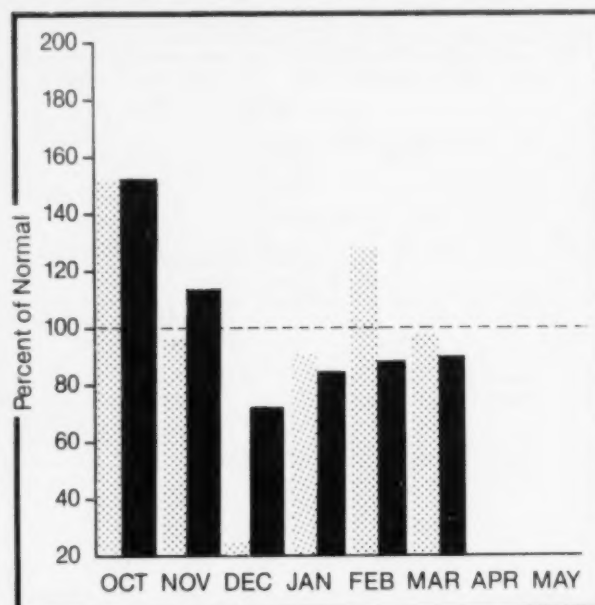
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average
Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

SPOKANE RIVER BASIN

WATER SUPPLY OUTLOOK:

Warm March temperatures averaging five degrees above normal coupled with near average precipitation reduced the snowpack in the Spokane River Basin. The snowpack went from 81% of normal for March 1st to 58% of normal for April 1st. Precipitation for March was 97% of normal bringing the water year to 91% of average. Streamflow runoff continued above average with March being 198% of normal. Forecasted streamflow for the summer is 60% of average. Reservoir storage in Coeur d' Alene Lake is at 133% of normal.

For more information contact your local Soil Conservation Service office.

SPOKANE RIVER BASIN

STREAMFLOW FORECASTS

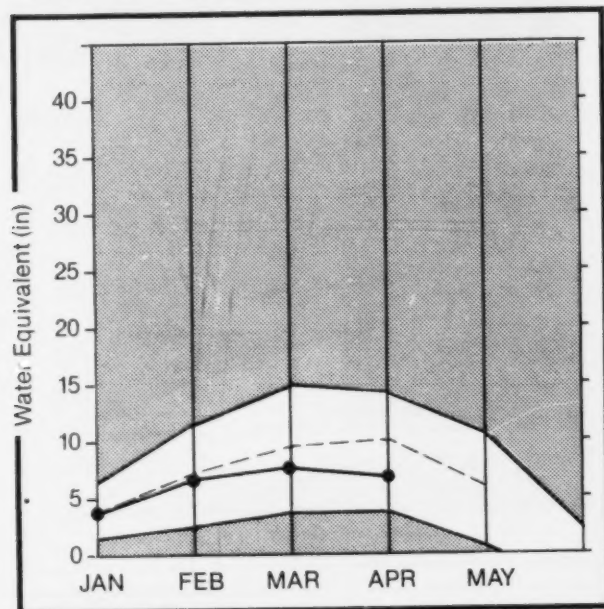
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SPOKANE at Post Falls	APR-SEP	2848.0	1710.0	69	84	34				
	APR-JUL	2754.0	1650.0	59	84	36				

RESERVOIR STORAGE (1000AF)				WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	THIS YEAR	LAST YEAR	AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE
COEUR D'ALENE	225.1	223.1	97.1	148.2	Spokane River	19	69 75

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

COLVILLE AND PEND OREILLE

Mountain snowpack* (inches)



*Based on selected stations

Maximum



Average



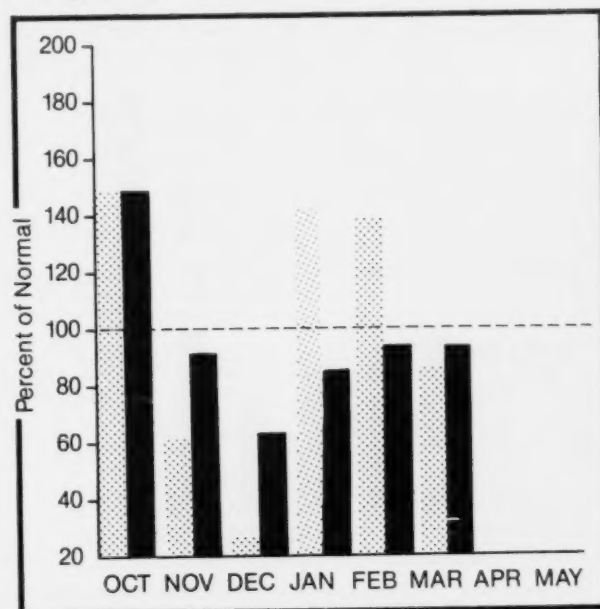
Minimum



Current



Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation



Year to date precipitation



COLVILLE - PEND OREILLE RIVER BASINS

WATER SUPPLY OUTLOOK:

Streamflow in the Colville-Pend Oreille basin was above average with the Pend Oreille River flowing 215% of normal and the Kettle at 240%. The Columbia River was 180% of average below Grand Coulee. Reservoir storage in Roosevelt was 278% of the April 1 normal with 4,784,700 acre feet of usable storage.

Temperatures averaged six degrees above normal for March reducing the snowpack from its March 1 reading of near 80% to a April 1 reading of 61% on the Kettle and 55% on the Colville. Forecasted streamflow for the summer is 73% on the Pend Oreille, 64% on the Colville and 80% on the Kettle.

For more information contact your local Soil Conservation Service office.

COLVILLE - PEND OREILLE RIVER BASINS

STREAMFLOW FORECASTS

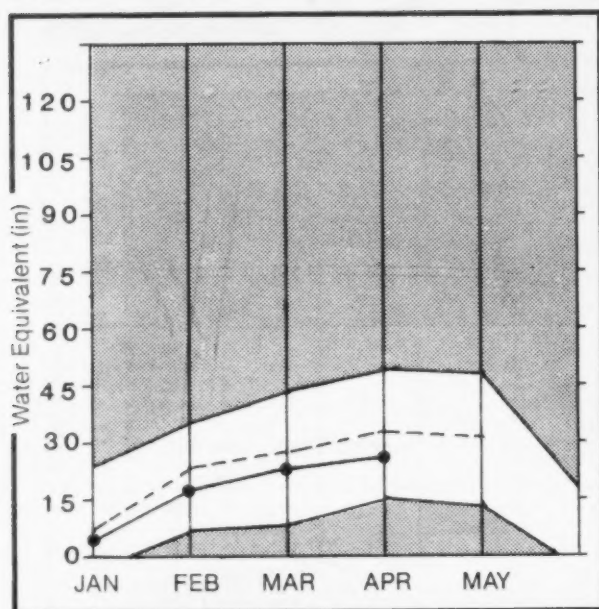
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
PEND OREILLE RIVER b1 Box Canyon	APR-SEP	15425.0	11300.0	73	78	50				
	APR-JUL	14156.0	10400.0	73	78	50				
	APR-JUN	12227.0	8930.0	73	78	50				
COLVILLE RIVER at Kettle Falls	APR-SEP	134.0	87.0	65	100	34				
	APR-JUL	123.0	80.0	65	100	34				
	APR-JUN	114.0	99.0	84	129	38				
KETTLE RIVER nr Laurier	APR-SEP	1829.0	1470.0	80	100	72				
	APR-JUL	1738.0	1390.0	79	100	72				
	APR-JUN	1581.0	1260.0	79	100	72				
COLUMBIA RIVER at Birchbank *	APR-SEP	44605.0	43800.0	98	116	80				
	APR-JUL	35705.0	35100.0	95	116	80				
	APR-JUN	26027.0	25500.0	97	116	80				
COLUMBIA RIVER at Grand Coulee *	APR-SEP	66841.0	59800.0	89	104	77				
	APR-JUL	56169.0	49800.0	88	104	77				
	APR-JUN	44036.0	39200.0	89	104	77				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF	
		THIS YEAR	LAST YEAR	AVE.			LAST YR.	AVERAGE
ROOSEVELT	5232.0	4403.4	992.0	1504.0	Colville River	3	46	55
BANKS	715.0	381.3	472.2	389.0	Pend Oreille River	12	68	70
					Kettle River	9	73	62
					Omac Lake, Twin Lakes	0	0	0
					Newman Lake	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

OKANOGAN AND METHOW

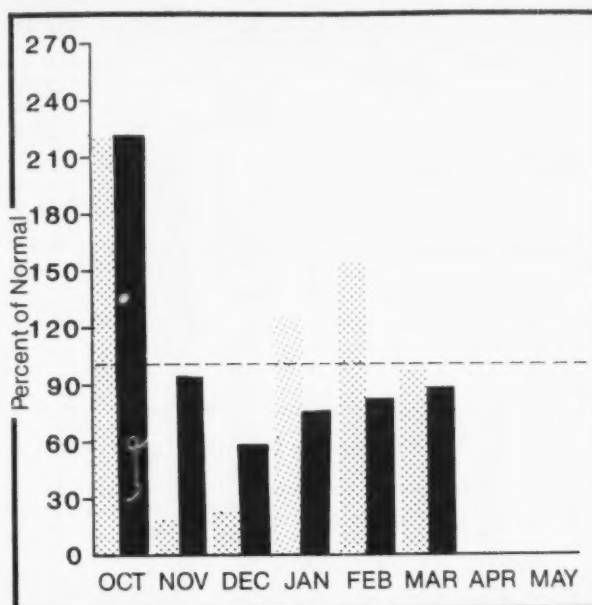
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

OKANOGAN - METHOW RIVER BASINS

WATER SUPPLY OUTLOOK:

Temperatures averaging five degrees above normal, coupled with below average precipitation for March produced streamflow of 166% of normal on the Okanogan River. The Similkameen River was 260% of March normal as much of the snowpack melted reducing the April 1 pack to 78% of average on the Okanogan. Snowpack in the Methow Drainage was 77% of average. Reservoir storage for April 1 was 102% of normal with 15,300 acre feet being stored in the Conconully lakes. Streamflows for summer are forecasted to be 80 % on the Okanogan and 88% on the Methow.

For more information contact your local Soil Conservation Service office.

OKANOGAN - METHOW RIVER BASINS

STREAMFLOW FORECASTS

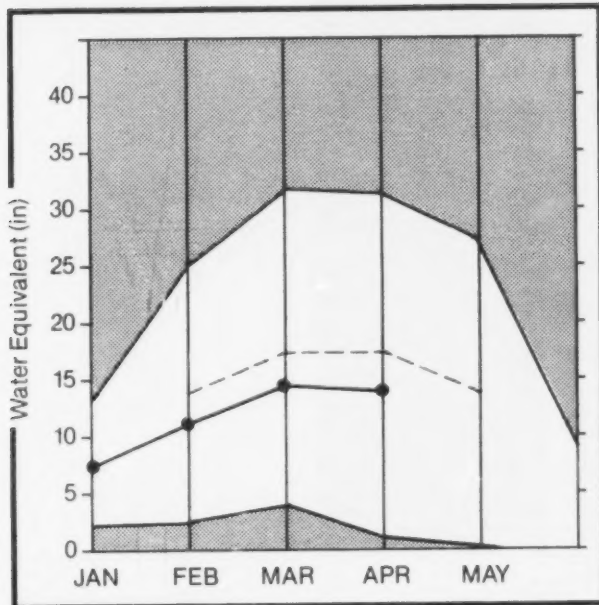
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	HIST PROBABLE (1000AF)	HIST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SIMILKAMEEN R. nr Nighthawk	APR-SEP	1462.0	1190.0	81	99	63				
	APR-JUL	1365.0	1100.0	80	99	43				
	APR-JUN	1161.0	952.0	81	100	44				
OKANOGAN R. nr Tonasket	APR-SEP	1644.0	1320.0	80	103	57				
	APR-JUL	1497.0	1200.0	80	103	57				
	APR-JUN	1262.0	1020.0	80	104	58				
METHOW RIVER nr Pateros	APR-SEP	980.0	870.0	88	115	43				
	APR-JUL	908.0	808.0	88	115	43				
	APR-JUN	773.0	696.0	90	116	44				

RESERVOIR STORAGE		(1000AF)			WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF	
		THIS YEAR	LAST YEAR	AVE.			LAST YR.	AVERAGE
CONCOMULLY LAKE (SALMON)	10.5	8.0	10.4	8.0	Okanogan River	30	91	81
CONCOMULLY RESERVOIR	13.0	7.3	13.0	7.0	Methow River	4	96	84

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WENATCHEE AND CHELAN

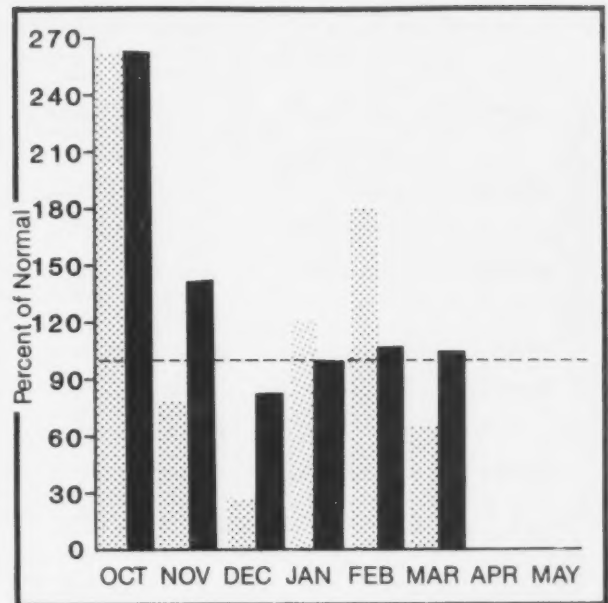
Mountain snowpack* (inches)



*Based on selected stations

Maximum  Average 
Minimum  Current 

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation  Year to date precipitation 

WENATCHEE - CHELAN RIVER BASINS

WATER SUPPLY OUTLOOK:

Warm temperatures averaging five degrees above normal reduced the basin's snowpack. The Chelan went from 96% for March 1st to 91% for April 1, the Wenatchee from 91% to 69%. The Stemilt maintained its pack at 125% of normal. High temperatures produced above average streamflows with the Wenatchee at 230%, Chelan at 211% and the Columbia at 188%. Streamflows for summer are forecasted to be 84% of normal on the Wenatchee, 89% on the Chelan and 88% on the Entiat. Reservoir storage in Chelan Lake was 302,400 acre feet or 143% of normal.

For more information contact your local Soil Conservation Service office.

WENATCHEE - CHELAN RIVER BASINS

STREAMFLOW FORECASTS

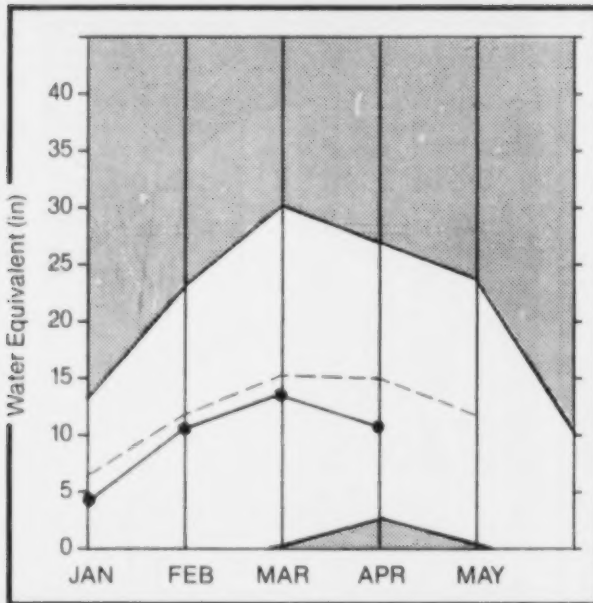
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
CHELAN RIVER at Chelan *	APR-SEP	1203.0	1080.0	89	107	73				
	APR-JUL	1055.0	935.0	88	104	72				
	APR-JUN	926.0	751.0	80	108	74				
STEHEKIN R. at Stehekin	APR-SEP	860.0	775.0	90	101	79				
	APR-JUL	727.0	656.0	90	101	79				
	APR-JUN	553.0	503.0	90	102	80				
ENTIAT RIVER nr Ardenvoir	APR-SEP	234.6	208.0	88	89	89				
	APR-JUL	213.0	189.0	88	89	89				
	APR-JUN	172.0	155.0	90	90	90				
WENATCHEE RIVER at Plain	APR-SEP	1270.0	1070.0	84	115	53				
	APR-JUL	1113.0	935.0	84	115	53				
	APR-JUN	899.0	755.0	85	115	53				
STEMILT nr Wenatchee (miners in)	MAY-SEP	138.0	110.0	79	80	80				
ICICLE CREEK nr Leavenworth	APR-SEP	370.0	290.0	78	78	78				
	APR-JUL	340.0	265.0	77	78	78				
	APR-JUN	270.0	213.0	78	79	79				
COLUMBIA R. bl Rock Island Dam *	APR-SEP	72781.0	65700.0	90	104	74				
	APR-JUL	61601.0	55100.0	89	103	75				
	APR-JUN	48384.0	43600.0	90	104	74				

RESERVOIR STORAGE		(1000AF)			WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF	
		THIS YEAR	LAST YEAR	AVE.			LAST YR.	AVERAGE
CHELAN LAKE	676.1	302.4	138.4	212.1	Chelan Lake Basin	6	114	91
					Entiat River	7	118	74
					Wenatchee River	8	72	69
					Colockum Creek	1	22	17
					Squilchuck Creek	1	91	86
					Stemilt Creek	1	103	85

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

YAKIMA

Mountain snowpack* (inches)



*Based on selected stations

Maximum



Average



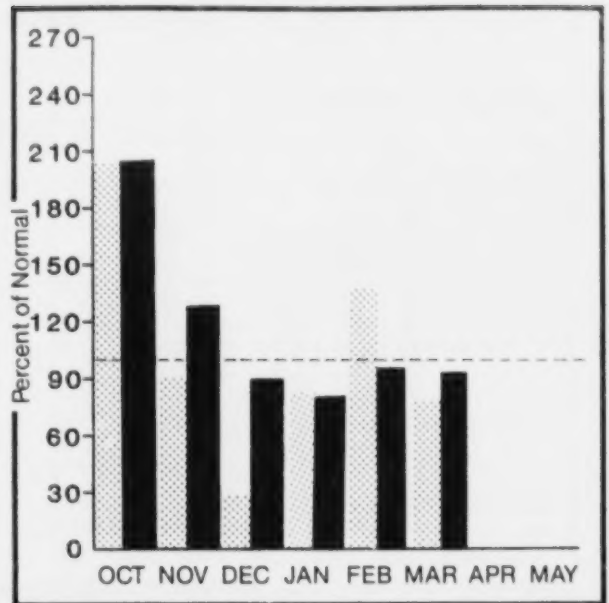
Minimum



Current



Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation



Year to date precipitation



YAKIMA RIVER BASIN

WATER SUPPLY OUTLOOK:

Streamflows were above normal in the Yakima for March with the Yakima River at Kiona flowing 181%. Temperatures averaged four degrees above normal causing snowpack to decline to 71% of normal April 1 readings, down from the March 1 readings of 87%. Reservoir storage increased to 92% of normal for the April 1 with the five major reservoirs storing 677,400 acre feet. Forecasted streamflows for the Yakima basin are; 80% for the Yakima at Martin, 83% for the Tieton, 81% for the Naches and 76% for the Ahtanum. Precipitation for March was 75% of normal bringing the water year to 90% of average.

For more information contact your local Soil Conservation Service office.

YAKIMA RIVER BASIN

STREAMFLOW FORECASTS

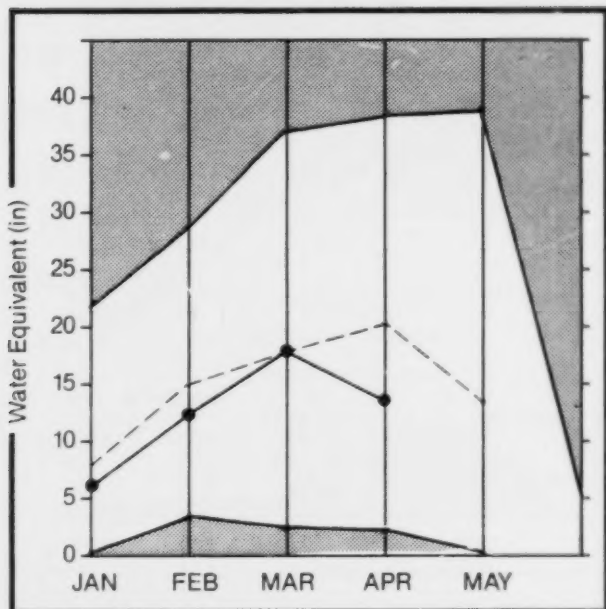
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
YAKIMA RIVER at Martin *	APR-SEP	139.0	112.0	80	91	71				
	APR-JUL	128.0	103.0	80	91	70				
	APR-JUN	111.0	89.0	80	90	70				
YAKIMA RIVER at Cle Elum *	APR-SEP	943.0	755.0	80	90	70				
	APR-JUL	854.0	684.0	80	90	70				
	APR-JUN	734.0	587.0	79	90	70				
YAKIMA RIVER nr Parker *	APR-SEP	2096.0	1660.0	79	90	62				
	APR-JUL	1898.0	1500.0	79	90	62				
	APR-JUN	1667.0	1320.0	79	90	62				
KACHESS RIVER nr Easton *	APR-SEP	121.0	97.0	80	90	70				
	APR-JUL	115.0	92.0	80	90	70				
	APR-JUN	101.0	82.0	81	91	71				
CLE ELM RIVER nr Roslyn *	APR-SEP	463.0	380.0	82	91	73				
	APR-JUL	422.0	342.0	81	90	72				
	APR-JUN	353.0	285.0	80	90	72				
BUMPING RIVER nr Nile *	APR-SEP	142.0	118.0	83	102	64				
	APR-JUL	129.0	108.0	83	102	64				
	APR-JUN	107.0	90.0	84	102	65				
AMERICAN RIVER nr Nile	APR-SEP	124.0	103.0	83	93	73				
	APR-JUL	113.0	94.0	83	93	73				
	APR-JUN	94.0	78.0	82	93	73				
TIETON RIVER at Tieton *	APR-SEP	246.0	205.0	82	102	64				
	APR-JUL	207.0	173.0	83	102	65				
	APR-JUN	165.0	138.0	83	102	62				
NACHES RIVER nr Naches *	APR-SEP	867.0	705.0	81	101	61				
	APR-JUL	784.0	638.0	81	101	61				
	APR-JUN	667.0	540.0	80	101	61				
AHATANUM CREEK nr Tappico *	APR-SEP	47.0	36.0	74	112	40				
	APR-JUL	43.0	33.0	74	112	42				
	APR-JUN	37.0	29.0	78	114	43				

RESERVOIR STORAGE		(1000AF)			WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVE. D	THIS YEAR AS % OF	
		THIS YEAR	LAST YEAR	AVE.			LAST YR.	AVERAGE
KEECHULUS	157.8	119.3	90.3	110.0	Yakima River	16	70	70
KACHESS	239.0	189.2	160.6	187.0	Ahtanum Creek	2	118	59
CLE ELEM	436.9	263.4	191.4	270.0				
BUMPING LAKE	33.7	12.4	3.8	11.0				
RIMROCK	198.0	149.1	92.7	122.0				

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WALLA WALLA

Mountain snowpack* (inches)



*Based on selected stations

Maximum



Average



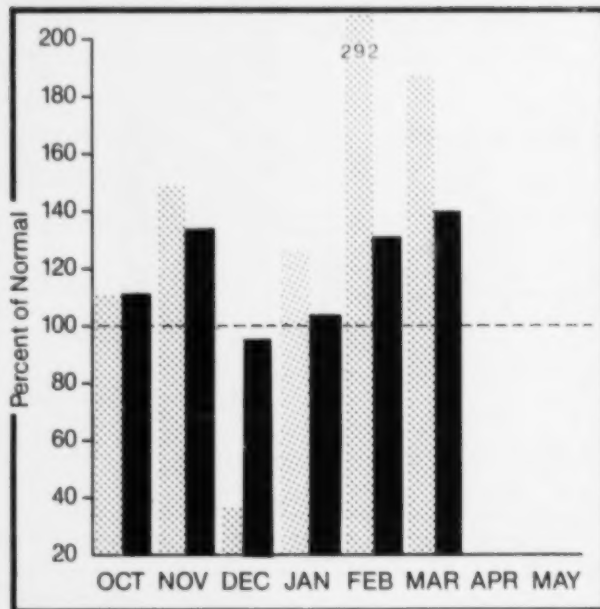
Minimum



Current



Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation



Year to date precipitation



WALLA WALLA RIVER BASIN

WATER SUPPLY OUTLOOK:

Precipitation for the Walla Walla station was 186% of average for March with the basin at 106% of normal. Temperatures averaged five degrees above normal for March reducing the snowpack for the basin to 66% for the April 1st readings. Streamflow for March was 163% of average for the Walla Walla River and 227% for the Snake River below Ice Harbor. Forecasted streamflows are 80% on the Walla Walla River for the summer.

For more information contact your local Soil Conservation Service office.

WALLA WALLA RIVER BASIN

STREAMFLOW FORECASTS

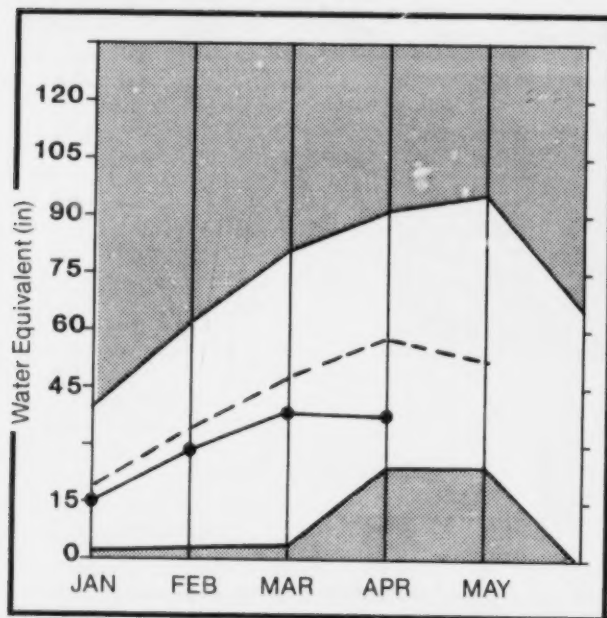
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
MILL CREEK at Walla Walla	APR-SEP	17.5	14.1	80	103	63				
	APR-JUL	17.3	14.0	80	98	63				
	APR-JUN	17.1	13.8	80	99	58				
COLUMBIA R. at The Dalles *	APR-SEP	101000.0	89700.0	88	104	74				
	APR-JUL	86500.0	75700.0	87	103	73				
	APR-JUN	70100.0	62400.0	89	104	74				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE THIS YEAR	USEABLE STORAGE LAST YEAR	USEABLE STORAGE AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	% OF AVERAGE
					Mill Creek	2	46	66

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

COWLITZ AND LEWIS

Mountain snowpack* (inches)



*Based on selected stations

Maximum



Average



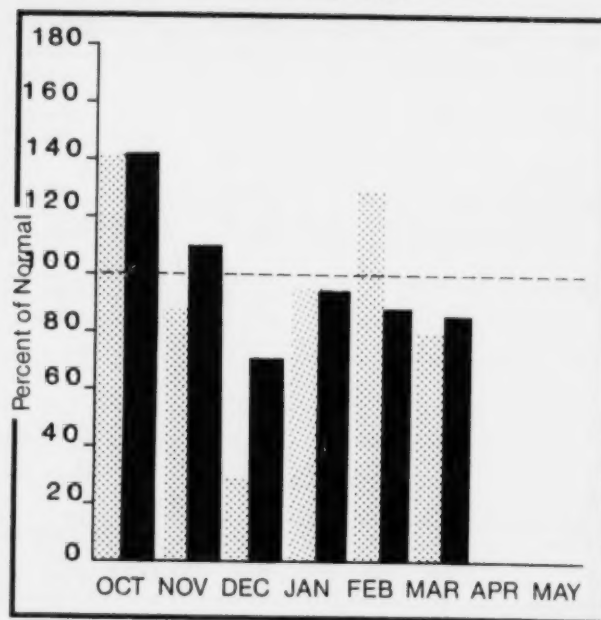
Minimum



Current



Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation



Year to date precipitation



COWLITZ - LEWIS RIVER BASINS

WATER SUPPLY OUTLOOK:

Forecasted streamflows on the Cowlitz River for the summer is 84% and on the Lewis River 84%. Streamflows for March were 122% of average on the Cowlitz River and 180% of normal on the Columbia River. Temperatures during March were five degrees above normal causing the snowpack to begin its spring melt nearly one month early. Snowpack was reduced to 74% of the April 1 normal. Precipitation for the Cowlitz-Lewis Basin was 79% of average for March bringing the water year to 85% of normal.

For more information contact your local Soil Conservation Service office.

COWLITZ - LEWIS RIVER BASINS

STREAMFLOW FORECASTS

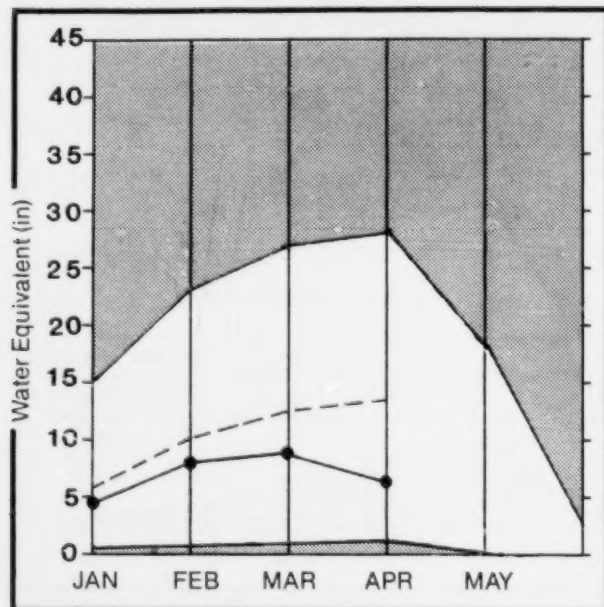
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
LEWIS RIVER at Ariel *	APR-SEP	1249.0	1060.0	84	112	58				
	APR-JUL	1086.0	923.0	84	112	58				
	APR-JUN	961.0	785.0	81	109	53				
COWLITZ R. bl Mayfield Dam *	APR-SEP	2038.0	1730.0	84	124	44				
	APR-JUL	1778.0	1510.0	84	124	44				
	APR-JUN	1502.0	1280.0	85	124	44				
COWLITZ R. at Castle Rock *	APR-SEP	2673.0	2270.0	84	121	49				
	APR-JUL	2323.0	1970.0	84	121	49				
	APR-JUN	1980.0	1680.0	84	121	49				

RESERVOIR STORAGE (1000AF)		WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE	WATERSHED	NO. COURSES AVE.D
	THIS YEAR	LAST YEAR AVE.		
			Cowlitz River	2
			Lewis River	3

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WHITE - GREEN

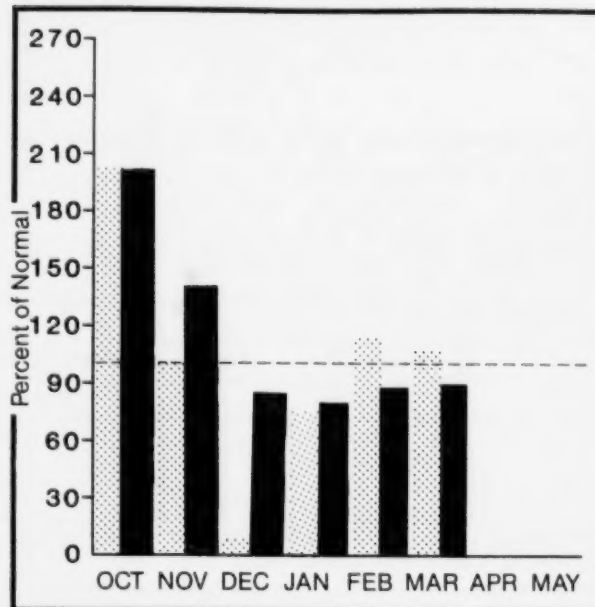
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

WHITE - GREEN RIVER BASINS

WATER SUPPLY OUTLOOK:

Snowpack continued its melt that started during February. Snow courses in the Cedar River were void of snow on the April 1 reading while the snowpack on the Green River was 45% of average and 69% on the White River. March temperatures were five degrees above average. Precipitation for the Month was 101% of normal while the water year precipitation to date is 89% of average. Streamflows are forecasted to be 70% on the Green and Cedar Rivers for the summer.

For more information contact your local Soil Conservation Service office.

WHITE - GREEN RIVER BASINS

STREAMFLOW FORECASTS

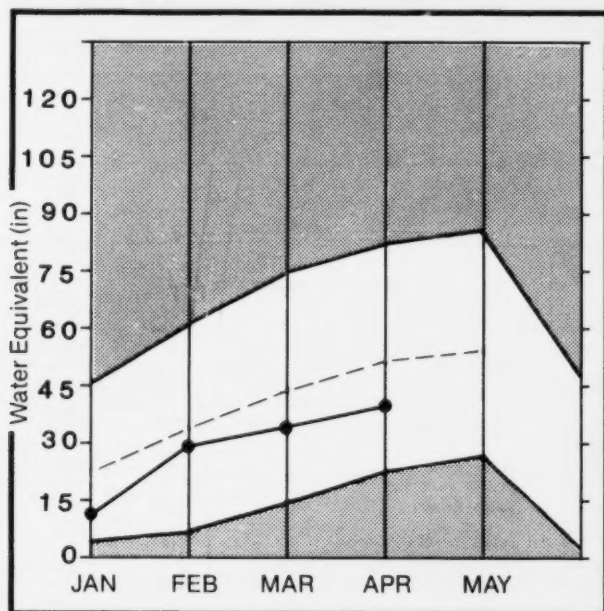
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
GREEN RIVER bl Howard Hanson Dam *	APR-SEP	316.0	222.0	70	70	70				
	APR-JUL	284.0	200.0	70	70	70				
	APR-JUN	256.0	180.0	70	70	70				
CEDAR RIVER nr Cedar Falls	APR-SEP	93.0	66.0	70	71	71				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE THIS YEAR	USEABLE STORAGE LAST YEAR	USEABLE STORAGE AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	% OF AVERAGE
					White River	3	74	68
					Green River	10	39	45

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

NORTH PUGET SOUND

Mountain snowpack* (inches)



*Based on selected stations

Maximum



Average



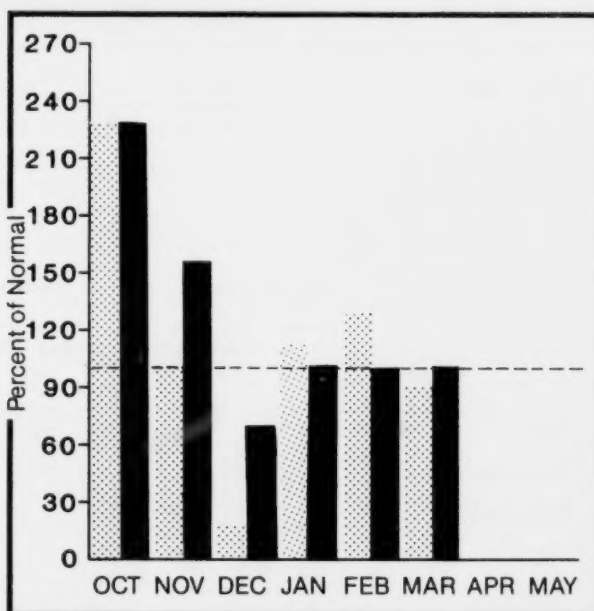
Minimum



Current



Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation



Year to date precipitation



NORTH PUGET SOUND RIVER BASINS

WATER SUPPLY OUTLOOK:

Precipitation averaged 89% of normal for March bringing the water year to 102%. Temperatures for March were five degrees above normal. Streamflows for March were above average with the Skagit at 152% and the Skykomish at 126%. Forecasted streamflows for the summer period are for 81% on the Skagit River. Reservoir storage is good with Ross Lake at 935,500 acre feet of usable storage on April 1 or 314% of average.

For more information contact your local Soil Conservation Service office.

NORTH PUGET SOUND RIVER BASINS

STREAMFLOW FORECASTS

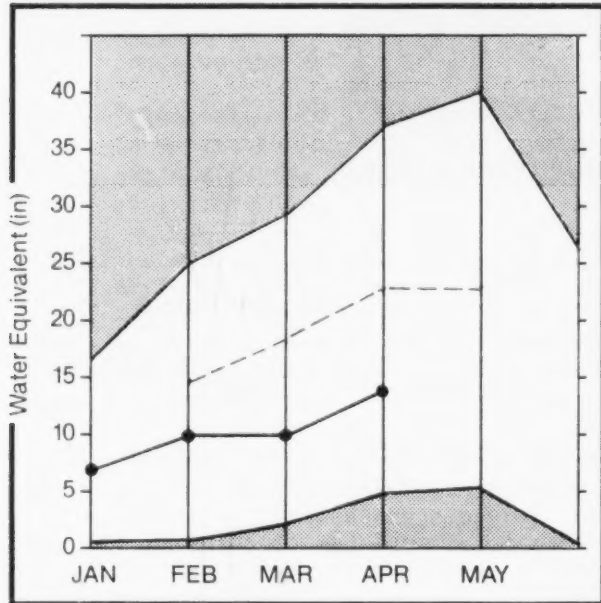
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SKAGIT RIVER at Newhalem *	APR-SEP	2356.0	1930.0	81	98	66				
	APR-JUL	1972.0	1620.0	82	98	66				
	APR-JUN	1485.0	1220.0	82	98	66				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	USEABLE THIS YEAR	USEABLE LAST YEAR	USEABLE AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE	
ROSS	1404.1	925.5	468.2	298.0	Skagit River	14	89	75
DIABLO RESERVOIR	90.6	89.3	84.6	---	Baker River	8	58	56
GORGE RESERVOIR	9.8	7.7	8.0	---	Cedar River	1	0	0
					Snoqualmie River	1	49	72
					Skykomish River	2	67	62

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

OLYMPIC

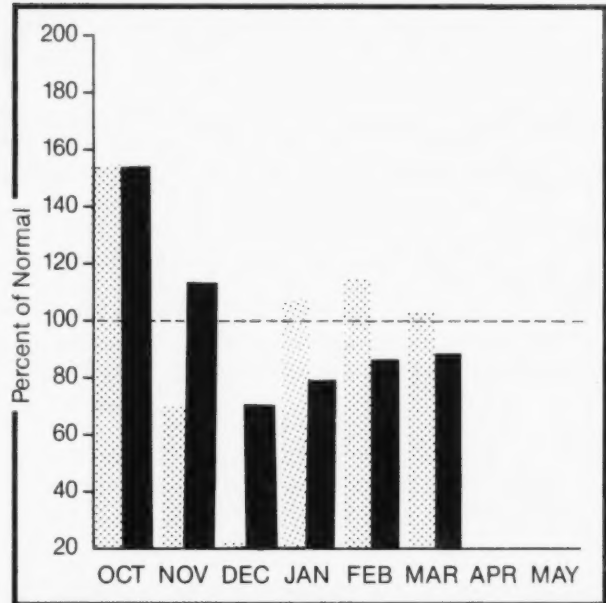
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average
Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

OLYMPIC PENINSULA RIVER BASINS

WATER SUPPLY OUTLOOK:

Temperatures averaging five degrees above normal for March have reduced the April snowpack. Snowpack was 33% of normal on the Elwah and 43% on the Duwamish. Streamflows are forecasted to be near 73% for the summer. Precipitation for March was average at 102% which brings the water year to date to 88% of average.

For more information contact your local Soil Conservation Service office.

OLYMPIC PENINSULA RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
DUNGENESS RIVER nr Sequim	APR-SEP	160.0	118.0	73	90	58				
	APR-JUL	130.0	96.0	73	90	58				
	APR-JUN	97.0	72.0	74	91	50				
ELWHA RIVER nr Port Angeles	APR-SEP	553.0	409.0	73	74	74				
	APR-JUL	454.0	336.0	74	74	74				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE THIS YEAR	USEABLE STORAGE LAST YEAR	USEABLE STORAGE AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE	
					Dungeness River	1	46	43
					Morse Creek	1	68	66
					Elwha River	1	39	33

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

VOLUNTEERS NEEDED

It is no longer news that federal dollars for conservation are decreasing and that state monies must increase if we are to protect our soil and water resources for future generations.

It is news that there is now firmly in place a strong national framework for conservation volunteers.

Volunteerism in Snow Survey is not new. In Washington we have had volunteers in Wenatchee and Yakima for several years. These volunteers are capable of performing the necessary requirements for Snow Survey with and without SCS assistance.

The shock of the newly-enacted Gramm-Rudman-Hollings law that calls for stringent budget cuts to reduce the federal deficit may be with us for quite a while. Meanwhile, we are softening the law's impact by nurturing volunteerism nationwide. At no cost to conservation districts, volunteers are already providing services that their respective states might otherwise find difficult or perhaps impossible to provide.

Consider the great potential for volunteerism within America's 3,000 conservation districts. Thousands of men and women who may be of differing political persuasions are nevertheless unified in their desire to do hands-on work for soil and water conservation.

We know these people well. University students and retirees; school children and youth groups; members of farm organizations, church and civic groups. Their desire to work for conservation is real. It is stronger, perhaps, than we realize. All that we need is the organizational structure for their increased hands-on participation.

Within each of its fifty state offices and at national headquarters, the Soil Conservation Service is mobilizing a major national effort to provide opportunities for conservation volunteers. In each state, a volunteer committee is being organized to assist area and district conservationists in setting up and administering the volunteer program. At SCS national headquarters, professional staffers are assisting the states, and writers and artists are creating multi-media information aids to promote the program.

The many links, then, that create a strong structure for volunteerism - from the Nation's capitol to the states, to the counties and thousands of local communities across the continent - are forged and functioning. Moreover, there are several examples of successful volunteer programs all across the country and here in Washington State. But there is room for more volunteer participation to help us carry out our mission of protecting the soil and water resources.

If you have time and would like to volunteer, contact the local SCS office nearest you. In the yellow pages, look under U. S. Department of Agriculture - Soil Conservation Service.

Snow Survey data can be obtained by calling one of the following local SCS offices:

PULLMAN PMC
Office (509) 335-7376
Farm (509) 335-9689

OLYMPIA, Area I

Area Office	FTS	434-9454 or 9455
Chehalis	(206)	748-0083
Kelso	(206)	425-1880
Lake Stevens	FTS	392-9259
Lynden	(206)	354-5658
Montesano	(206)	249-5900
Mt. Vernon	(206)	424-5153
Olympia FO	FTS	434-9448
Port Angeles	FTS	396-4277
Port Orchard	(206)	876-5529
Puyallup	(206)	845-5533
Raymond	(206)	942-5945
Renton	FTS	399-3325 or 3326
Vancouver	FTS	422-7631

EPHRATA, AREA II

Area Office	FTS	446-4374 or 4375
Davenport	(509)	725-4181 or 725-1345
Ephrata FO	FTS	446-4385
Moses Lake	(509)	765-3261
Okanogan	(509)	422-2750
Othello	(509)	488-2802
Ritzville	(509)	659-0254
Waterville	(509)	745-8362
Wenatchee	FTS	390-0242 or 0260

YAKIMA, AREA III

Area Office	FTS	446-5865 or 5866
Ellensburg	(509)	925-5375
Goldendale	(509)	773-5823
Pasco	(509)	545-8546 or 8547
Prosser	(509)	786-1923
Sunnyside	(509)	837-7911
Toppenish	(509)	865-4012
Walla Walla	FTS	434-6340
White Salmon	(509)	493-1936
Yakima FO	FTS	446-5909

SPOKANE, AREA IV

Area Office	FTS	439-3726
Cheney	(509)	458-6200, Ext 2309
Clarkston	(509)	758-8012
Colfax	(509)	397-4636
Colville	(509)	684-5067
Dayton	(509)	382-2351
Fairfield	(509)	283-2331
Newport	(509)	447-4217
Pomeroy	(509)	843-1998
Republic	(509)	775-3473
Spokane FO	FTS	439-2120

SOIL SURVEY OFFICES

Bellingham	(206)	676-3520
Inchelium	(509)	722-4395
Nespelem	FTS	439-9431
Wapato	(509)	877-4004



The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

- Canada:** Ministry of the Environment, Water
Investigations Branch, Victoria, British Columbia
- States:** Washington State Department of Ecology
Washington State Department of Natural Resources
- Federal:** Department of the Army
Corps of Engineers
U.S. Department of Agriculture
Forest Service
U.S. Department of Commerce
NOAA, National Weather Service
U.S. Department of the Interior
Bonneville Power Administration
Bureau of Reclamation
Geological Survey
National Park Service
- Local:** City of Tacoma
City of Seattle
Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company
Snohomish County P.U.D.
- Private:** Okanogan Irrigation District
Wenatchee Heights Irrigation District
Newman Lake Homeowners Association

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

986/5



United States
Department of
Agriculture

Soil
Conservation
Service

Spokane,
Washington



Washington Water Supply Outlook

May 1, 1986

NEWARK PUBLIC LIBRARY

JUN - 5 1986



A 57. 46/7:

Foreword

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado (New Mexico)	2490 West 26th Ave., Denver, CO 80211
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	50 South Virginia Street, Third Floor, Reno, NV 89505
Oregon	1220 Southwest 3rd Ave., 16th Floor, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82602

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 95802; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Saskatchewan, and N.W.T. — The Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta, T3C 1A6.

Washington Water Supply Outlook

and

**Federal — State — Private
Cooperative Snow Surveys**

Issued by

Wilson Scaling
Chief
Soil Conservation Service
Washington, D.C.

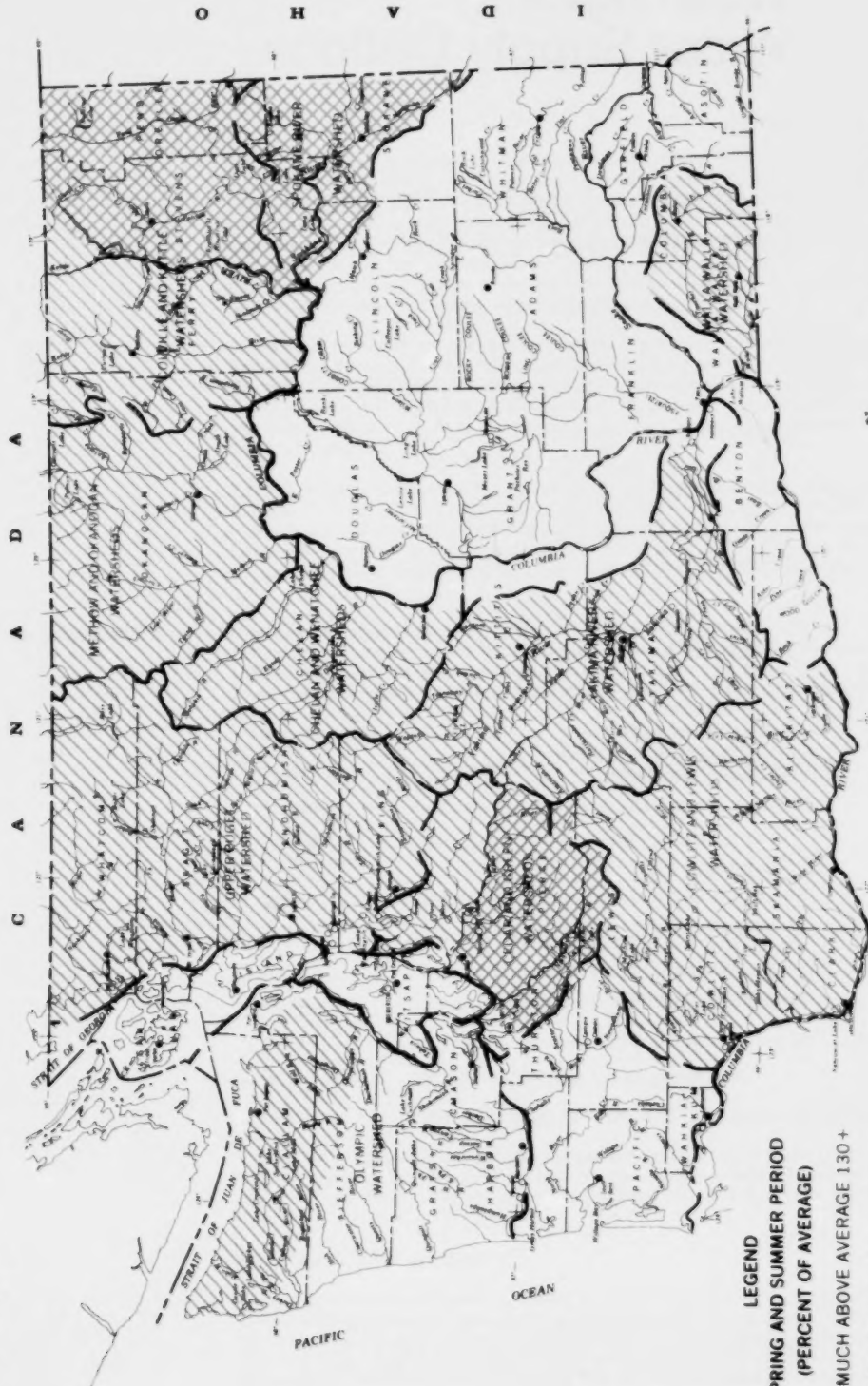
Released by

Lynn A. Brown
State Conservationist
Soil Conservation Service
Spokane, Washington

Prepared by

William F. Weller
Water Supply Specialist
Room 360 U.S. Courthouse
Spokane, Washington 99201

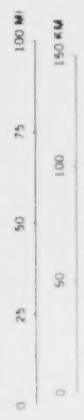
All programs and services of the USDA
are available to everyone without regard
to race, creed, color, sex, age, handicap
or national origin.



LEGEND
SPRING AND SUMMER PERIOD
(PERCENT OF AVERAGE)

- MUCH ABOVE AVERAGE 130 +
- ABOVE AVERAGE 110-130
- NEAR AVERAGE 90-110
- BELOW AVERAGE 70-90
- MUCH BELOW AVERAGE 70 + LESS
- NOT FORECAST
- WATERSHED BOUNDARY

MAY 1, 1986
STREAMFLOW PROSPECTS
WASHINGTON



SOURCE: Data compiled by SCS
Field Personnel

GENERAL OUTLOOK

SUMMARY:

Spring continued to invade Washington State with its varied weather patterns during April. Streamflows varied from 51% of average on the Chehalis River to 188% of normal on the Similkameen River. Snowcover continued its decline with the Olympic Basin at 27% of average for April. Precipitation varied from 169% of normal for the Pend Oreille Basin to 49% on the Wenatchee-Chelan Basin. Reservoir storage for irrigation remained near average for the month. Streamflows are expected to be below normal for the summer.

SNOWPACK:

Snowcover varies from below average to much below average throughout Washington. Fewer snowcourses are read during the May 1st readings than in previous months. Five of the 34 SNOTEL sites are bare of snow. The Okanogan Basin shows the best average with 88%, while the Olympic Basin has the lowest at 27% of normal. Other basin averages are Yakima 62%, Wenatchee 58%, Skagit 70%, Cowlitz 57%, and the Pend Oreille 60%. Maximum snowpack occurred at the Paradise SNOTEL where 59 inches of snow water were measured.

PRECIPITATION:

April moisture was much above average for the Colville-Pend Oreille Basin at 169%. The Wenatchee Basin was the lowest at 49% of normal. Other basins with near normal precipitation for April are the Spokane at 101%, Cowlitz 100% and the Green River at 93%. Those with below average precipitation include the Yakima at 79%, Walla Walla at 88% and the Okanogan at 74%. Most of the precipitation was in the form of rain and only minor amounts of snowfall were reported from the SNOTEL sites.

RESERVOIRS:

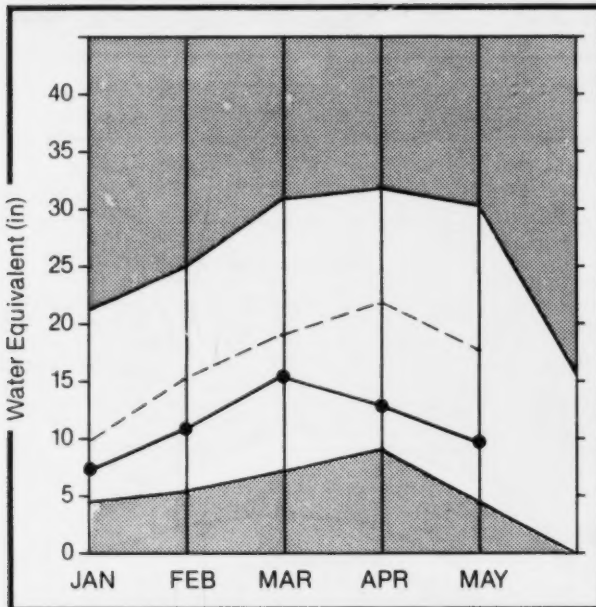
Irrigation reservoirs are at 102% of May 1 average storage. The Yakima reservoirs are storing 796,000 acre feet or 75% of capacity. The Okanogan reservoirs are storing 16,700 acre feet which is 71% of capacity. Roosevelt Lake is at 2,700,700 acre feet or 51% of capacity. Lake Chelan is at 85% of May 1 normal and 57% of capacity. Ross reservoir is at 141% of May 1 normal and 65% of capacity.

STREAMFLOW:

April streamflow varied widely over Washington with the Similkameen River continuing high at 188% of normal and the Chehalis River the low at 51% of average. Most westside streams were low with the Skagit at 87%, the Skykomish at 75% and the Cowlitz River at 68%. The Wenatchee River continued above average at 124% as did the Chelan at 124%, the Kettle River 135% and the Pend Oreille River at 119%. The Yakima River was at 89% and the Spokane River was 82% of normal for April. Streamflow is forecast to be below average to much below average over all of Washington.

SPOKANE

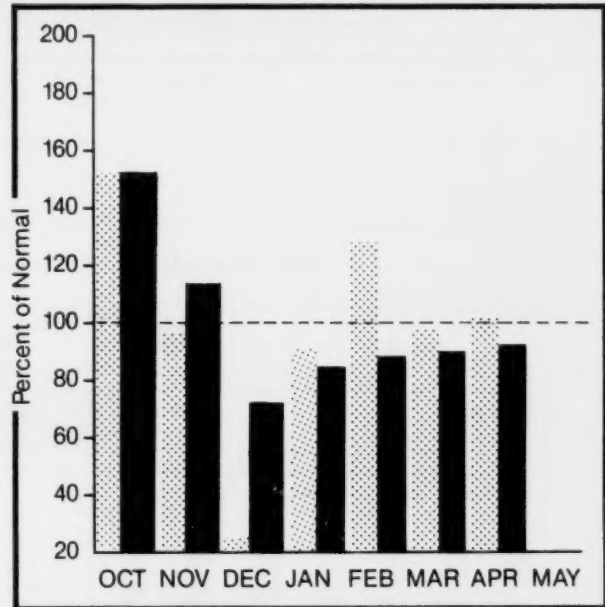
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average
Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

SPOKANE RIVER BASIN

WATER SUPPLY OUTLOOK :

Snowcover continued to decline during April, going from 58% of normal on April 1 to 56% on May 1. April precipitation was average at 101%, with most of it in the form of rain. April streamflow was 82% of normal. Forecasted streamflow is 51% of average. Storage in Coeur d' Alene Lake is 153,600 acre feet or 68% of normal for May 1.

For more information contact your local Soil Conservation Service office.

SPOKANE RIVER BASIN

STREAMFLOW FORECASTS

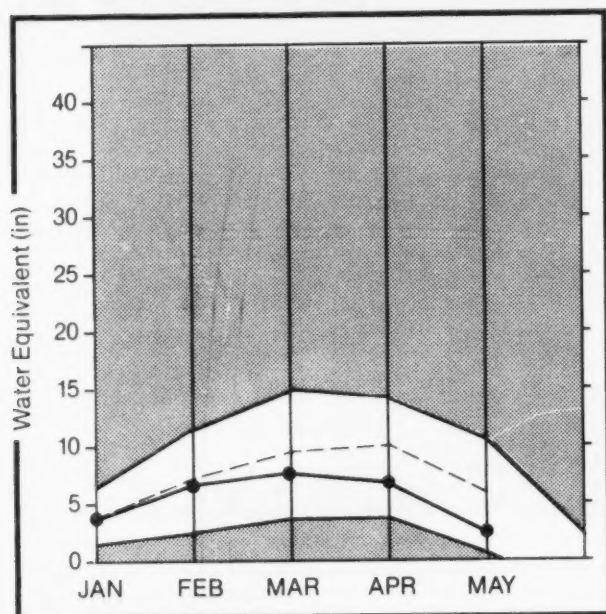
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SPOKANE at Post Falls	MAY-SEP	1977.0	1010.0	51	73	29				
	MAY-JUL	1884.0	956.0	50	73	29				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE THIS YEAR	USEABLE STORAGE LAST YEAR	USEABLE STORAGE AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE	
COEUR D'ALENE	225.1	153.6	214.0	275.1	Spokane River	8	47	50

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

COLVILLE AND PEND OREILLE

Mountain snowpack* (inches)



*Based on selected stations

Maximum



Average



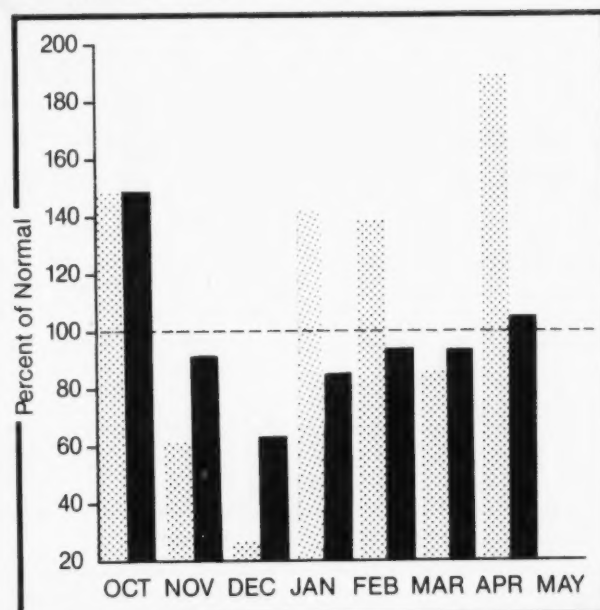
Minimum



Current



Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation



Year to date precipitation



COLVILLE - PEND OREILLE RIVER BASINS

WATER SUPPLY OUTLOOK:

Snowmelt continued in the Colville-Pend Oreille Basin with streamflow at 119% of April normal. Streamflow on the Kettle River was also high at 135% of average. Precipitation was 169% of normal for April with 3.22 inches recorded at the Colville airport. The water year to date precipitation has been 100% of average. Snowcover was 60% of average. Forecasted streamflows are Kettle 80%, Pend Oreille 62% and 63% on the Colville. Storage in Roosevelt is 197% of average at 2,700,700 acre feet.

For more information contact your local Soil Conservation Service office.

COLVILLE - PEND OREILLE RIVER BASINS

STREAMFLOW FORECASTS

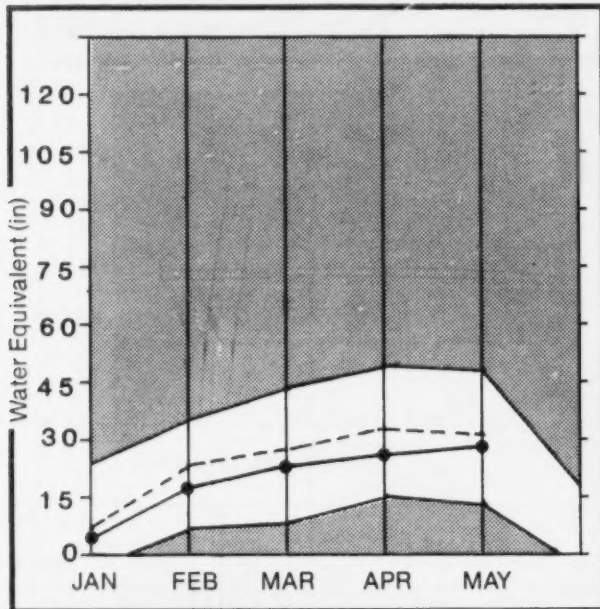
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
PEND OREILLE RIVER b1 Box Canyon	MAY-SEP	13316.0	8640.0	64	85	45				
	MAY-JUL	12047.0	7700.0	63	84	44				
	MAY-JUN	10119.0	6480.0	64	84	44				
CHAMOKANE CREEK	JUL-AUG	3.6	2.9	80	111	28				
COLVILLE RIVER at Kettle Falls	MAY-SEP	85.1	52.8	62	99	25				
	MAY-JUL	74.3	46.8	62	100	26				
	MAY-JUN	66.0	41.6	63	100	26				
KETTLE RIVER nr Laurier	MAY-SEP	1581.0	1260.0	79	98	62				
	MAY-JUL	1491.0	1180.0	79	97	61				
	MAY-JUN	1334.0	1050.0	78	97	61				
COLUMBIA RIVER at Birchbank *	MAY-SEP	41733.0	41900.0	100	113	87				
	MAY-JUL	32833.0	32900.0	100	113	87				
	MAY-JUN	23155.0	23200.0	100	113	87				
COLUMBIA RIVER at Grand Coulee *	MAY-SEP	60100.0	54800.0	91	102	80				
	MAY-JUL	49400.0	44500.0	90	101	79				
	MAY-JUN	37300.0	33600.0	90	101	79				

RESERVOIR STORAGE		(1000AF)			WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	THIS YEAR	LAST YEAR	AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE	
ROOSEVELT	5232.0	2700.7	947.3	1310.0	Colville River	0	0	0
BANKS	715.0	661.5	645.4	435.0	Pend Oreille River	10	64	61
					Kettle River	2	83	67
					Omac Lake, Twin Lakes	0	0	0
					Newman Lake	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

OKANOGAN AND METHOW

Mountain snowpack* (inches)



*Based on selected stations

Maximum



Average



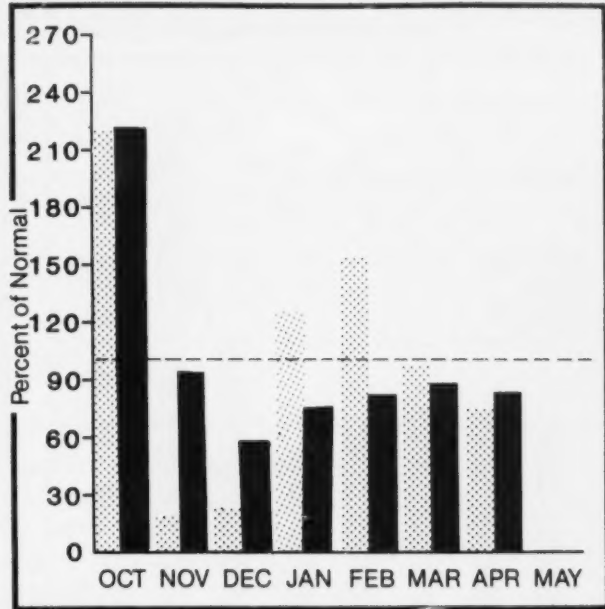
Minimum



Current



Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation



Year to date precipitation



OKANOGAN - METHOW RIVER BASINS

WATER SUPPLY OUTLOOK:

Streamflow remained high in the Okanogan with the Similkameen River at 188% of normal and the Okanogan River at 146%. All Low elevation snow is now gone with the Salmon Meadows SNOTEL site bare. Snowcover in the upper basin is at 88% of April normal. Precipitation was 74% of average for April, for a water year total of 86%. Storage in the Conconully reservoirs is normal at 16,700 acre feet. Forecasted streamflows are Okanogan River 75%, Methow River 80% and the Similkameen River 75%.

For more information contact your local Soil Conservation Service office.

OKANOGAN - METHOW RIVER BASINS

STREAMFLOW FORECASTS

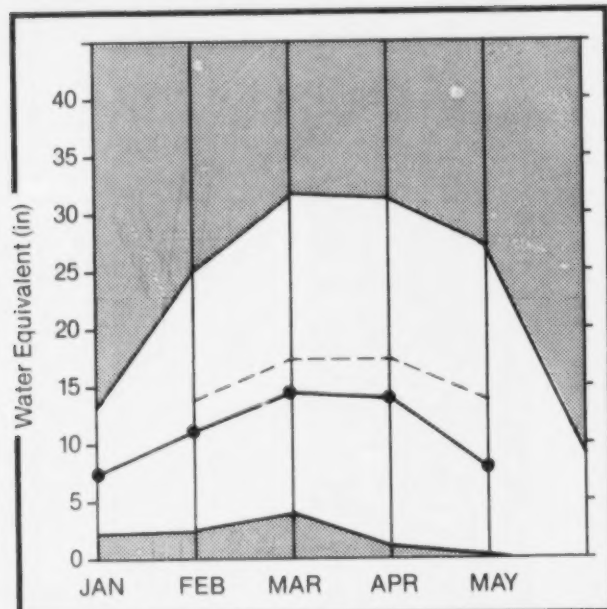
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SIMILKAMEEN R. nr Nighthawk	MAY-SEP	1376.0	1040.0	75	104	48				
	MAY-JUL	1279.0	959.0	74	103	47				
	MAY-JUN	1075.0	806.0	74	103	47				
OKANOGAN R. nr Tonasket	MAY-SEP	1517.0	1150.0	75	105	47				
	MAY-JUL	1370.0	1030.0	75	104	46				
	MAY-JUN	1135.0	851.0	74	104	46				
METHOW RIVER nr Pateros	MAY-SEP	900.0	728.0	80	105	57				
	MAY-JUL	828.0	660.0	79	104	56				
	MAY-JUN	693.0	554.0	79	104	56				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	USEABLE THIS YEAR	USEABLE LAST YEAR	USEABLE AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE
CONCOMULY LAKE (SALMON)	10.5	8.6	9.8	8.0	Okanogan River	24	112 93
CONCOMULY RESERVOIR	13.0	8.1	13.0	8.0	Methow River	4	112 79

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WENATCHEE AND CHELAN

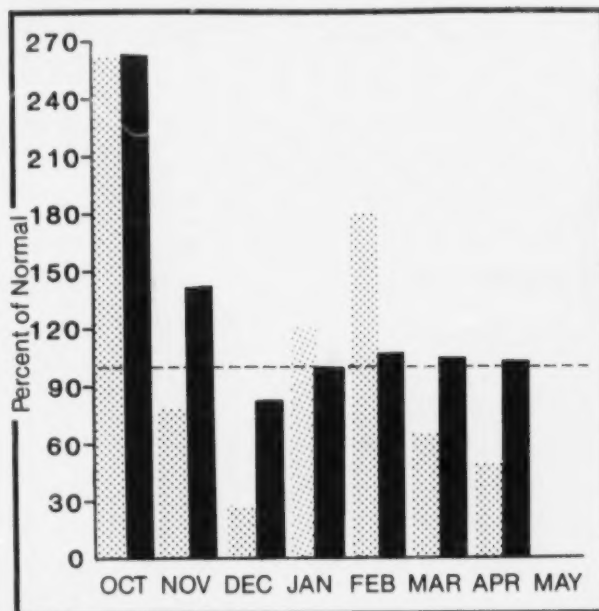
Mountain snowpack* (inches)



*Based on selected stations

Maximum  Average 
Minimum  Current 

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation  Year to date precipitation 

WENATCHEE - CHELAN RIVER BASINS

WATER SUPPLY OUTLOOK:

Precipitation for April was 49% of normal bringing the water year total to 101% of normal. Storage in Chelan Lake is 382,800 acre feet or 85% of May 1 normal. Snowcover is 84% of May 1 average with Lyman Lake SNOTEL reporting 52 inches of snow water on May 1. April streamflow was 129% for the Chelan and 124% on the Wenatchee River. Forecasted streamflows are 75% on the Wenatchee, 79% on the Entiat and 79% on the Chelan River.

For more information contact your local Soil Conservation Service office.

WENATCHEE - CHELAN RIVER BASINS

STREAMFLOW FORECASTS

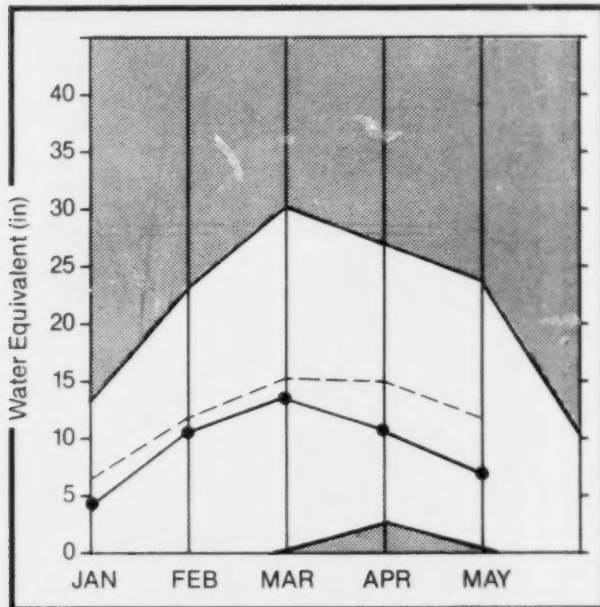
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
CHELAN RIVER at Chelan *	MAY-SEP	1094.0	864.0	78	94	64				
	MAY-JUL	946.0	747.0	78	94	64				
	MAY-JUN	717.0	570.0	79	95	64				
STEHEKIN R. at Stehekin	MAY-SEP	860.0	694.0	80	91	71				
	MAY-JUL	727.0	592.0	81	91	71				
	MAY-JUN	553.0	447.0	80	91	71				
ENTIAT RIVER nr Ardenvoir	MAY-SEP	218.0	172.0	78	94	64				
	MAY-JUL	197.0	156.0	79	94	64				
	MAY-JUN	155.8	124.0	79	94	65				
WENATCHEE RIVER at Plain	MAY-SEP	1136.0	852.0	75	108	42				
	MAY-JUL	1002.0	752.0	75	108	42				
	MAY-JUN	765.0	581.0	75	109	43				
WENATCHEE R. at Peshastin	MAY-SEP	1523.0	1160.0	76	109	43				
	MAY-JUL	1356.0	1030.0	75	109	43				
	MAY-JUN	1048.0	807.0	77	110	44				
STEMILT nr Wenatchee (miners in)	MAY-SEP	138.0	102.0	73	107	41				
ICICLE CREEK nr Leavenworth	APR-SEP	370.0	278.0	75	108	42				
	APR-JUL	340.0	260.0	76	109	44				
	APR-JUN	270.0	205.0	75	109	43				
COLUMBIA R. b1 Rock Island Dam *	MAY-SEP	65550.0	59800.0	91	102	80				
	MAY-JUL	54375.0	48900.0	89	101	79				
	MAY-JUN	41160.0	37100.0	90	101	79				

RESERVOIR STORAGE		(1000AF)			WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF	
		THIS YEAR	LAST YEAR	AVE.			LAST YR.	AVERAGE
CHELAN LAKE	676.1	382.8	202.8	448.8	Chelan Lake Basin	4	103	98
					Entiat River	0	0	0
					Wenatchee River	5	78	56
					Colockum Creek	1	0	4
					Squilchuck Creek	0	0	0
					Stemilt Creek	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

YAKIMA

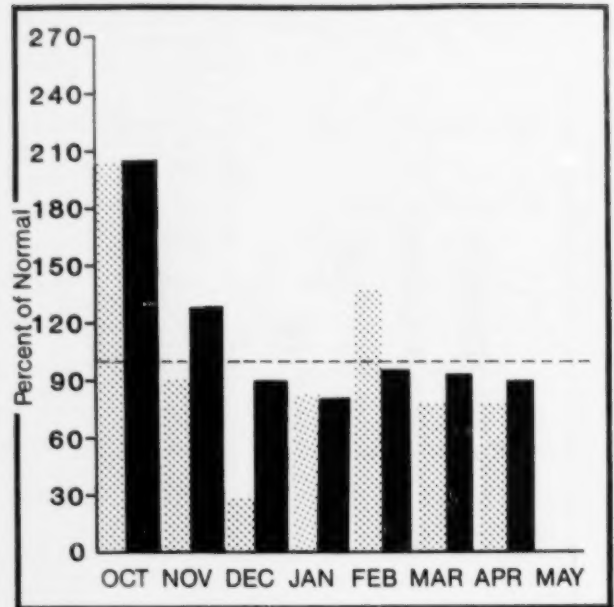
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average
Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

YAKIMA RIVER BASIN

WATER SUPPLY OUTLOOK:

Reservoir storage remains good with the Yakima reservoirs storing 796,000 acre feet or 102% of May 1 average. Streamflow was low during April with 89% of normal. Temperatures averaging 2 degrees below normal and precipitation 79% of April normal contributed to the lower flows. Snowcover continued to decline with the May 1 readings being 61% of average. Summer streamflows are forecast to be; Yakima River near Parker 75%, Naches River 75%, Ahtanum Creek 70%, and the Tieton River 73%.

For more information contact your local Soil Conservation Service office.

YAKIMA RIVER BASIN

STREAMFLOW FORECASTS

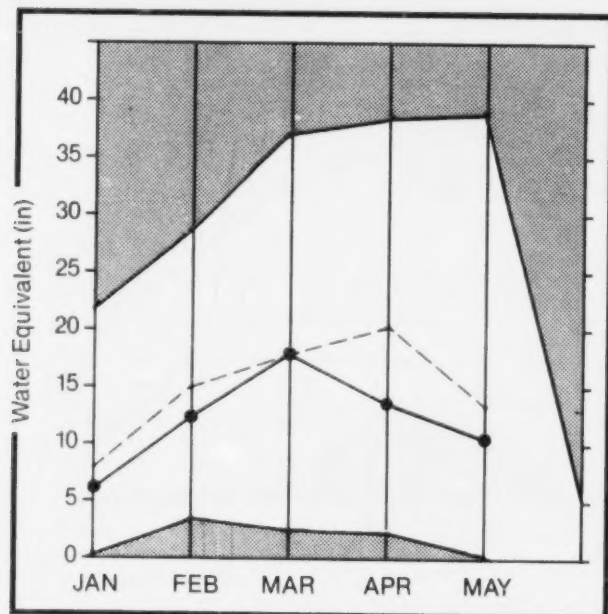
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
YAKIMA RIVER at Martin *	MAY-SEP	114.0	86.0	75	88	63				
	MAY-JUL	103.0	77.0	74	86	63				
	MAY-JUN	86.0	66.0	76	88	65				
YAKIMA RIVER at Cle Elum *	MAY-SEP	780.0	592.0	75	89	63				
	MAY-JUL	693.0	527.0	76	89	63				
	MAY-JUN	574.0	436.0	75	89	63				
YAKIMA RIVER nr Parker *	MAY-SEP	1711.0	1160.0	67	87	49				
	MAY-JUL	1510.0	1030.0	68	87	49				
	MAY-JUN	1274.0	866.0	67	87	49				
KACHESS RIVER nr Easton *	MAY-SEP	98.0	73.0	74	89	60				
	MAY-JUL	92.0	70.0	76	90	62				
	MAY-JUN	78.0	58.0	74	88	60				
CLE ELUM RIVER nr Roslyn *	MAY-SEP	400.0	280.0	70	82	58				
	MAY-JUL	360.0	252.0	70	82	58				
	MAY-JUN	291.0	203.0	69	82	58				
BUMPING RIVER nr Nile *	MAY-SEP	126.0	100.0	79	94	64				
	MAY-JUL	114.0	90.0	78	94	64				
	MAY-JUN	91.0	72.0	79	95	64				
AMERICAN RIVER nr Nile	MAY-SEP	114.0	85.0	74	87	62				
	MAY-JUL	103.0	76.0	73	85	62				
	MAY-JUN	82.0	61.0	74	87	62				
TIETON RIVER at Tieton *	MAY-SEP	214.0	158.0	73	90	58				
	MAY-JUL	175.0	129.0	73	90	58				
	MAY-JUN	133.0	98.0	73	89	58				
NACHES RIVER nr Naches *	MAY-SEP	728.0	547.0	75	89	61				
	MAY-JUL	645.0	480.0	74	88	60				
	MAY-JUN	530.0	395.0	74	88	61				
AHTANUM CREEK nr Timpico *	MAY-SEP	39.0	27.3	70	92	49				
	MAY-JUL	35.0	24.7	70	91	49				
	MAY-JUN	29.0	20.3	70	93	48				

RESERVOIR STORAGE		(1000AF)			WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	THIS YEAR	LAST YEAR	AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	% OF AVERAGE
KEECHELUS	157.8	130.4	126.9	119.0	Yakima River	11	65	63
KACHESS	239.0	181.7	200.7	197.0	Ahtanum Creek	1	143	62
CLE ELEM	436.9	299.6	258.5	308.0				
BUMPING LAKE	33.7	15.7	17.2	15.0				
RIMROCK	198.0	168.6	115.3	144.0				

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WALLA WALLA

Mountain snowpack* (inches)



*Based on selected stations

Maximum



Average



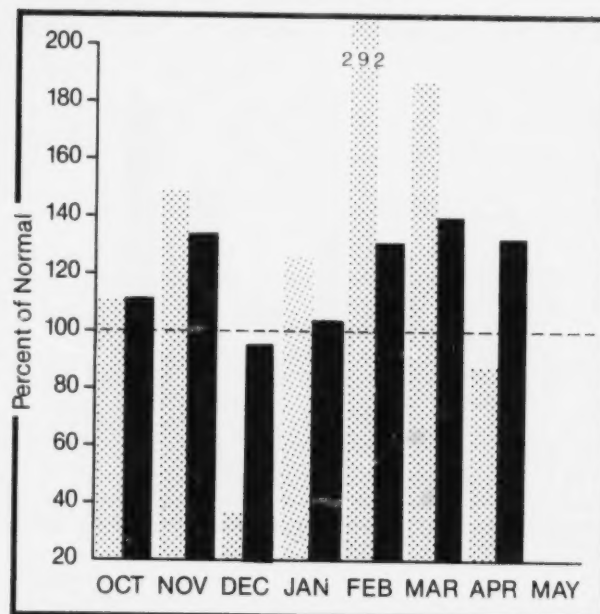
Minimum



Current



Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation



Year to date precipitation



WALLA WALLA RIVER BASIN

WATER SUPPLY OUTLOOK:

Streamflows dropped below normal for April at 85%. Normal temperatures and below average precipitation of 88% caused the lower flows. The snowpack has melted at the lower elevations. The water content at the Touchet SNOTEL site is 68% of normal May 1 readings. The total precipitation for the water year to date is 99% of average. Forecasted streamflow for the Walla Walla River is 70%.

For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS

RESERVOIR STORAGE

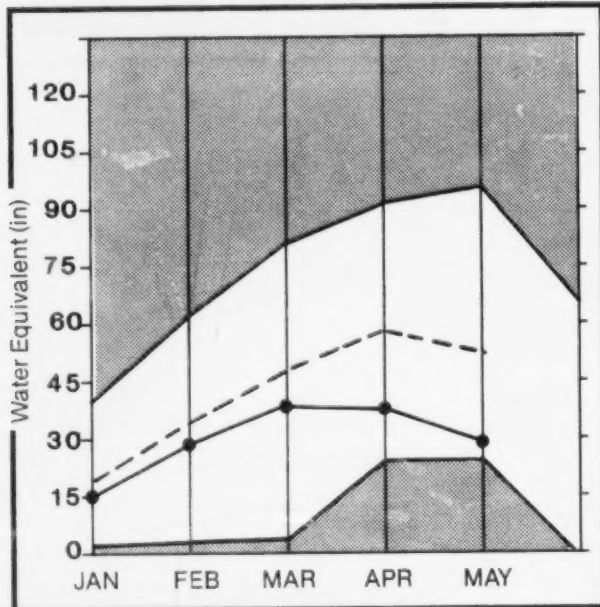
(1000AF)

WATERSHED SNOWPACK ANALYSIS

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

COWLITZ AND LEWIS

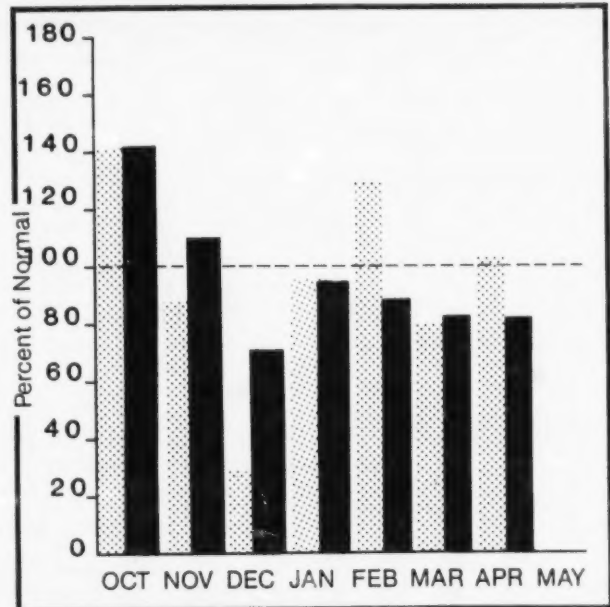
Mountain snowpack* (inches)



*Based on selected stations

Maximum  Average 
Minimum  Current 

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation  Year to date precipitation 

COWLITZ - LEWIS RIVER BASINS

WATER SUPPLY OUTLOOK:

Streamflows are forecast to be 80% on the Cowlitz and 87% on the Lewis River for the summer. Snowcover is at 57% of May 1 normal. April precipitation was 100 of average keeping the year to date precipitation at 87% of normal. April streamflow on the Cowlitz River was 68% of average. Maximum snowpack on Mt. St. Helens was at the Plains of Abraham SNOTEL where 48 inches of snow water remained on the pillows for the May 1 readings.

For more information contact your local Soil Conservation Service office.

COWLITZ - LEWIS RIVER BASINS

STREAMFLOW FORECASTS

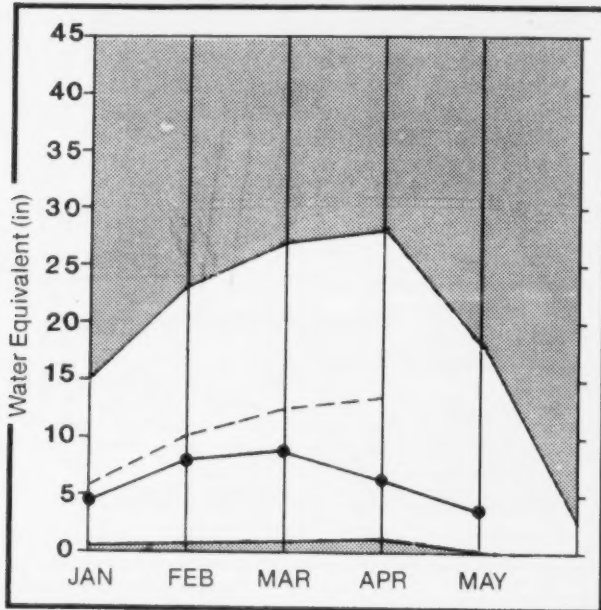
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
LEWIS RIVER at Ariel *	MAY-SEP	900.0	791.0	87	112	64				
	MAY-JUL	737.0	648.0	87	112	64				
	MAY-JUN	612.0	538.0	87	112	64				
COWLITZ R. bl Mayfield Dam *	MAY-SEP	1617.0	1290.0	79	129	31				
	MAY-JUL	1357.0	1090.0	80	129	31				
	MAY-JUN	1081.0	865.0	80	129	31				
COWLITZ R. at Castle Rock *	MAY-SEP	2058.0	1650.0	80	129	31				
	MAY-JUL	1708.0	1370.0	80	129	31				
	MAY-JUN	1365.0	1090.0	79	129	31				

RESERVOIR STORAGE (1000AF)				WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	THIS YEAR	USEABLE STORAGE LAST YEAR	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE	
			Ave.				
				Cowlitz River	1	78	67
				Lewis River	3	79	68

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WHITE - GREEN

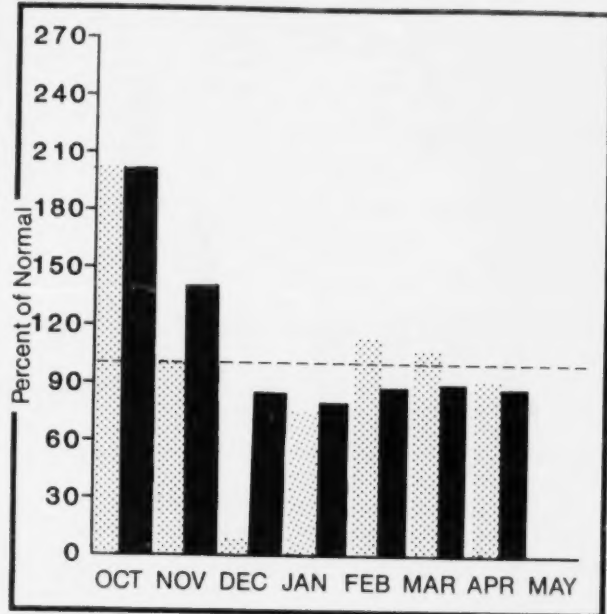
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average
Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

WHITE - GREEN RIVER BASINS

WATER SUPPLY OUTLOOK:

Snowpack showed some minor improvement with 70% of May 1 normal on the White and 64% on the Green. Streamflow remained low with near normal temperatures and 93% of average April precipitation. The water year to date precipitation is at 89% of average. Streamflows are forecast to be 64% on the Green River and 70% on the Cedar River for the summer.

For more information contact your local Soil Conservation Service office.

WHITE - GREEN RIVER BASINS

STREAMFLOW FORECASTS

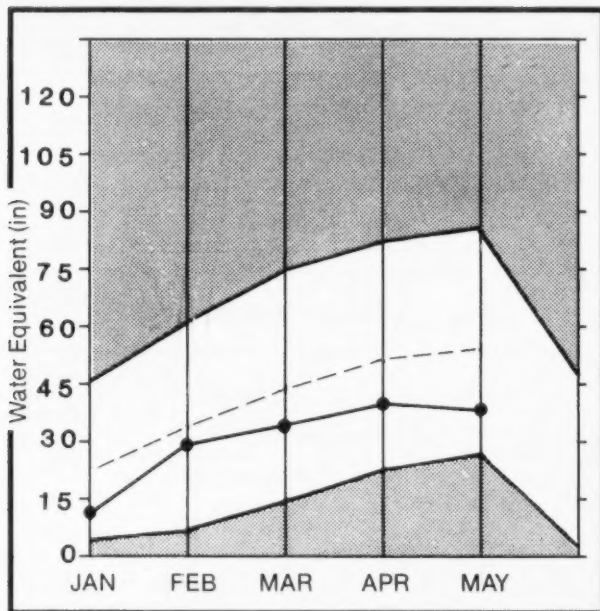
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
GREEN RIVER bi Howard Hanson Dam *	MAY-SEP	316.0	205.0	64	82	48				
	MAY-JUL	284.0	185.0	65	82	48				
	MAY-JUN	256.0	175.0	68	68	68				
CEDAR RIVER nr Cedar Falls	MAY-SEP	74.2	52.0	70	88	53				
	MAY-JUL	65.5	46.5	70	89	53				
	MAY-JUN	54.1	38.0	70	87	54				

RESERVOIR STORAGE (1000AF)				WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE THIS YEAR	USEABLE STORAGE LAST YEAR	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE	
				White River	1	95	70
				Green River	6	36	64

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

NORTH PUGET SOUND

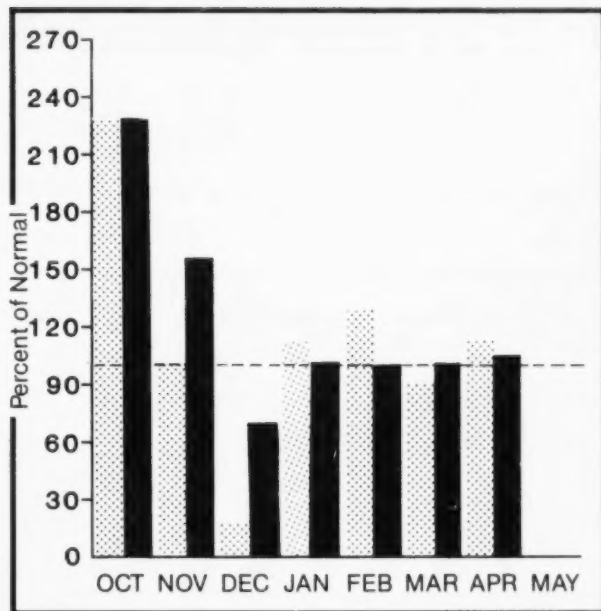
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

NORTH PUGET SOUND RIVER BASINS

WATER SUPPLY OUTLOOK:

Precipitation averaged 119% of normal for April bringing the water year to 104% of normal as of May 1. Streamflow in the Skagit River was 87% of average for April. Snowcover in the Basin was 70% of the May 1 average. Forecasted streamflows are for 75% of normal for the summer months. Reservoir storage in Ross Lake is 65% of capacity and 141% of the May 1 average.

For more information contact your local Soil Conservation Service office.

NORTH PUGET SOUND RIVER BASINS

STREAMFLOW FORECASTS

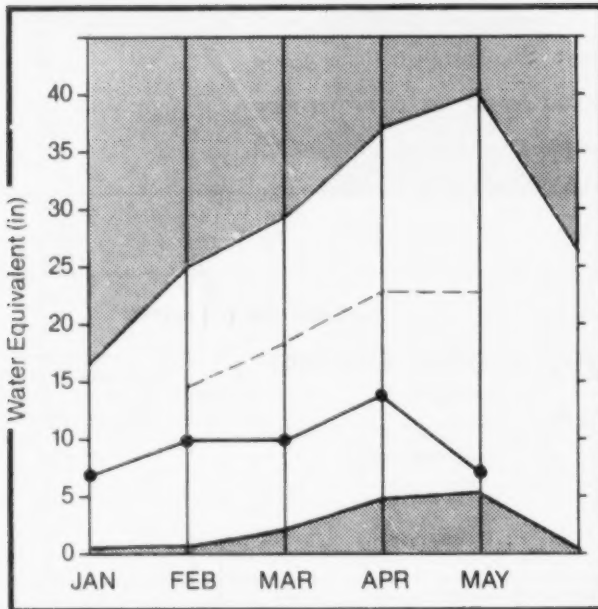
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SKAGIT RIVER at Newhalem *	MAY-AUG	2502.0	1900.0	75	90	60				
	MAY-SEP	2356.0	1767.0	75	90	60				
	MAY-JUL	1972.0	1479.0	75	90	60				
	MAY-JUN	1485.0	1157.0	77	93	63				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	USEABLE THIS YEAR	USEABLE LAST YEAR	USEABLE AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE	
ROSS	1404.1	911.8	607.2	644.4	Skagit River	13	89	69
DIABLO RESERVOIR	90.6	86.1	86.0	—	Baker River	9	60	64
GORGE RESERVOIR	9.8	7.8	7.8	—	Cedar River	0	0	0
					Snoqualmie River	1	52	72
					Skykomish River	2	68	50

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

OLYMPIC

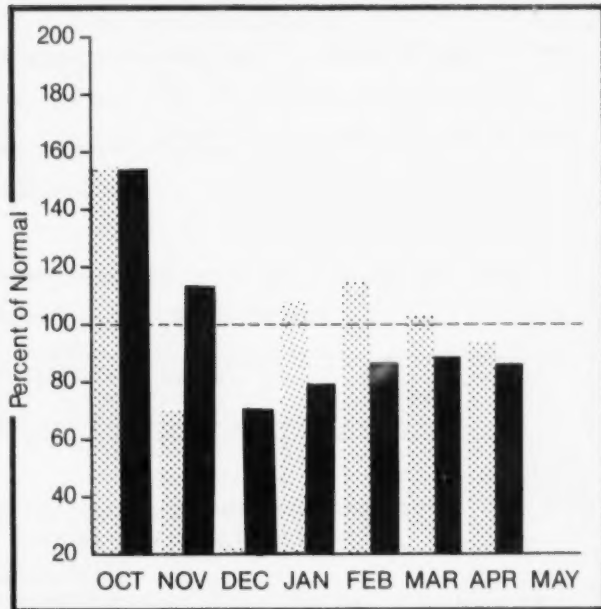
Mountain snowpack* (inches)



*Based on selected stations

Maximum  Average 
Minimum  Current 

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation  Year to date precipitation 

OLYMPIC PENINSULA RIVER BASINS

WATER SUPPLY OUTLOOK:

Much below average streamflows are forecast for the Olympic Basin for the coming summer. Forecasts for Duwamish, Elwah and for Morse Creek are 70%. Precipitation for April was 87% of average with the water year totals to May 1 at 88%. Snowcover is very low with the basin average at 27% for May 1.

For more information contact your local Soil Conservation Service office.

OLYMPIC PENINSULA RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
DUNGENESS RIVER nr Sequim	MAY-SEP	160.0	112.0	70	87	53				
	MAY-JUL	130.0	91.0	70	87	53				
	MAY-JUN	97.0	68.0	70	87	54				
ELWHA RIVER nr Port Angeles	MAY-SEP	553.0	387.0	69	87	53				
	MAY-JUL	454.0	320.0	70	87	54				

RESERVOIR STORAGE (1000AF)				WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE	USEABLE STORAGE	WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF LAST YR. AVERAGE
	THIS YEAR	LAST YEAR	AVE.			
				Dungeness River	1	50 36
				Horse Creek	1	69 60
				Elwha River	1	29 19

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

IMPORTANT NOTICE

WATER SUPPLY OUTLOOK FOR WASHINGTON

If you wish to continue to receive this publication, detach this page, sign your name in the space below, fold on the heavy line, staple or tape the folded page and mail. If more than one copy of the publication is desired, place the number in the box by your signature.

☐ Signed: _____

Suggestions, comments or remarks: _____

Print or type your name and address on back
of this sheet, if it is not there already
(FOLD HERE)



UNITED STATES
DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
360 U.S. COURTHOUSE
SPOKANE, WASHINGTON 99201

PLACE
STAMP
HERE

SNOW SURVEY SUPERVISOR
SOIL CONSERVATION SERVICE
360 U.S. COURTHOUSE
SPOKANE, WASHINGTON 99201

(STAPLE OR TAPE HERE)

(DETACH HERE)

Snow Survey data can be obtained by calling one of the following local SCS offices:

PULLMAN PMC Office (509) 335-7376
 Farm (509) 335-9689

OLYMPIA, Area I

Area Office FTS 434-9454 or 9455

Chehalis (206) 748-0083
 Kelso (206) 425-1880
 Lake Stevens FTS 392-9259
 Lynden (206) 354-5658
 Montesano (206) 249-5900
 Mt. Vernon (206) 424-5153
 Olympia FO FTS 434-9448
 Port Angeles FTS 396-4277
 Port Orchard (206) 876-5529
 Puyallup (206) 845-5533
 Raymond (206) 942-5945
 Renton FTS 399-3325 or 3326
 Vancouver FTS 422-7631

EPHRATA, AREA II

Area Office FTS 446-4374 or 4375
 Davenport (509) 725-4181 or
 725-1345
 Ephrata FO FTS 446-4385
 Moses Lake (509) 765-3261
 Okanogan (509) 422-2750
 Othello (509) 488-2802
 Ritzville (509) 659-0254
 Waterville (509) 745-8362
 Wenatchee FTS 390-0242 or 0260

YAKIMA, AREA III

Area Office FTS 446-5865 or 3866
 Ellensburg (509) 925-5375
 Goldendale (509) 773-5823
 Pasco (509) 545-8546 or 8547
 Prosser (509) 786-1923
 Sunnyside (509) 837-7911
 Toppenish (509) 865-4012
 Walla Walla FTS 434-6340
 White Salmon (509) 493-1936
 Yakima FO FTS 446-5909

SPOKANE, AREA IV

Area Office FTS 439-3726
 Cheney (509) 458-6200, Ext 2309
 Clarkston (509) 758-8012
 Colfax (509) 397-4636
 Colville (509) 684-5067
 Dayton (509) 382-2351
 Fairfield (509) 283-2331
 Newport (509) 447-4217
 Pomeroy (509) 843-1998
 Republic (509) 775-3473
 Spokane FO FTS 439-2120

SOIL SURVEY OFFICES

Bellingham (206) 676-3520
 Inchellium (509) 722-4395
 Nespelem FTS 439-9431
 Wapato (509) 877-4004



The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

- Canada:** Ministry of the Environment, Water
Investigations Branch, Victoria, British Columbia
- States:** Washington State Department of Ecology
Washington State Department of Natural Resources
- Federal:** Department of the Army
Corps of Engineers
U.S. Department of Agriculture
Forest Service
U.S. Department of Commerce
NOAA, National Weather Service
U.S. Department of the Interior
Bonneville Power Administration
Bureau of Reclamation
Geological Survey
National Park Service
Bureau of Indian Affairs
- Local:** City of Tacoma
City of Seattle
Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company
Snohomish County P.U.D.
- Private:** Okanogan Irrigation District
Wenatchee Heights Irrigation District
Newman Lake Homeowners Association

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

986 / 6



United States
Department of
Agriculture

Soil
Conservation
Service

Spokane,
Washington



Washington Water Supply Outlook

JUNE 1, 1986

NEWARK PUBLIC LIBRARY



A 57.46 / 7:

Foreword

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado (New Mexico)	2490 West 26th Ave., Denver, CO 80211
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	50 South Virginia Street, Third Floor, Reno, NV 89505
Oregon	1220 Southwest 3rd Ave., 16th Floor, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82602

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 95802; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Saskatchewan, and N.W.T. — The Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta, T3C 1A6.

Washington Water Supply Outlook

and

**Federal — State — Private
Cooperative Snow Surveys**

Issued by

Wilson Scaling
Chief
Soil Conservation Service
Washington, D.C.

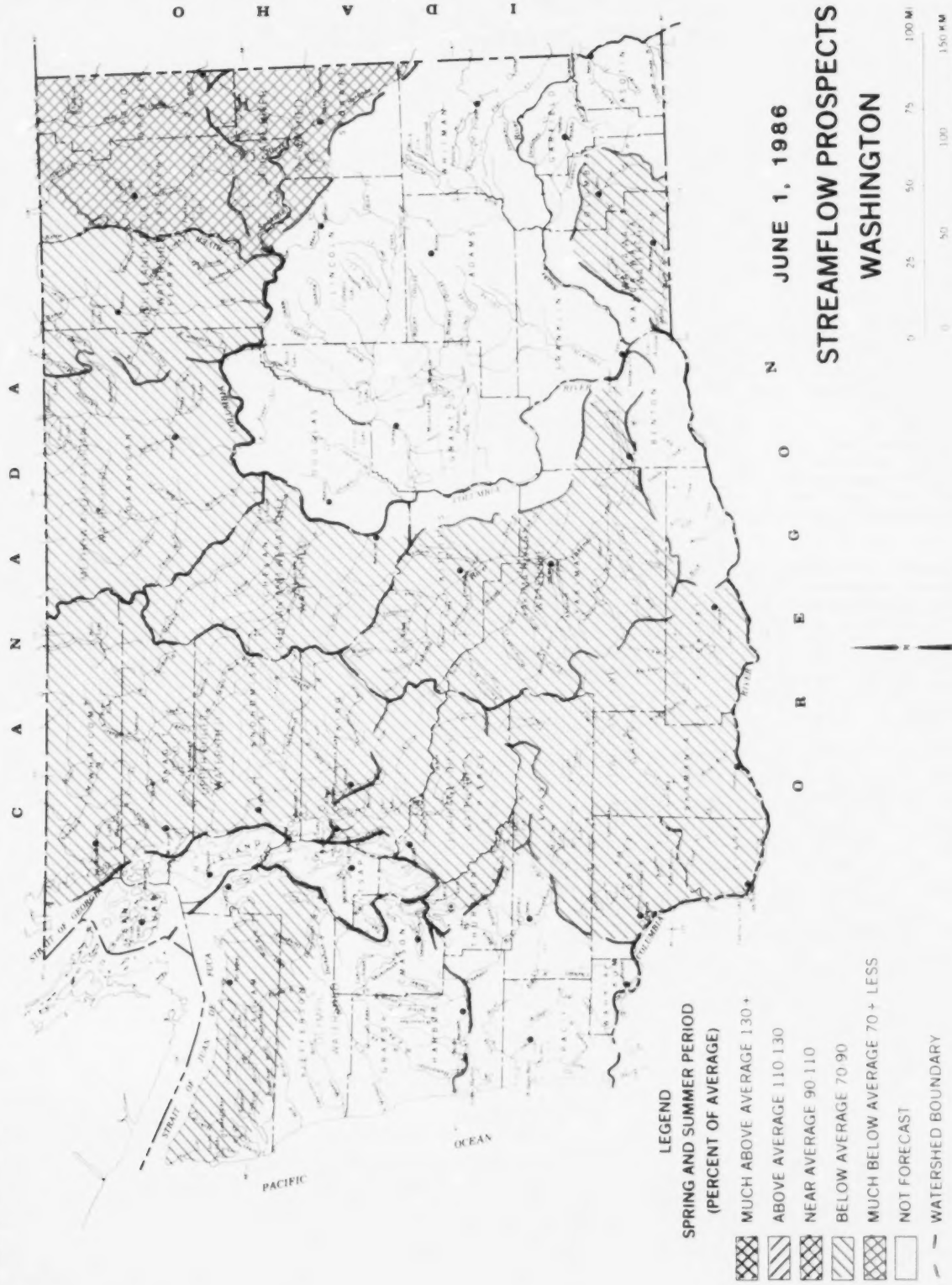
Released by

Lynn A. Brown
State Conservationist
Soil Conservation Service
Spokane, Washington

Prepared by

William F. Weller
Water Supply Specialist
Room 360 U.S. Courthouse
Spokane, Washington 99201

All programs and services of the USDA
are available to everyone without regard
to race, creed, color, sex, age, handicap
or national origin.



GENERAL OUTLOOK

SUMMARY:

THIS IS THE FINAL WATER SUPPLY OUTLOOK REPORT OF THE SEASON, NEXT REPORT JANUARY 1987. With only a few manual snow courses read the 1st of June the SNOTEL sites give most of our snow information. Sixteen of the 34 sites were bare of snow on June 1. Paradise with 51 inches of water content had the most snow. Reservoir storage continues to be near normal. Precipitation was good over most of the state. Temperatures were below normal during the early part of May then above average for the last week.

SNOWPACK:

Above average temperatures for the last week in May accelerated the melt of the snow pack. Snow has melted from 16 of the 34 SNOTEL sites in Washington compared to last year when 20 sites were bare. There were 19 manual snow courses read this month with this small amount of courses few conclusions can be drawn.

PRECIPITATION:

The month of May had varied precipitation over Washington. The west and southeast were above normal while the eastern and central part were below normal. The Olympic Basin was at 209% of average with the north Puget Sound at 160%. The Okanogan area had 35% of normal precipitation while the Colville-Pend Oreille had 68%. The Yakima Basin was at 186% of average.

RESERVOIRS:

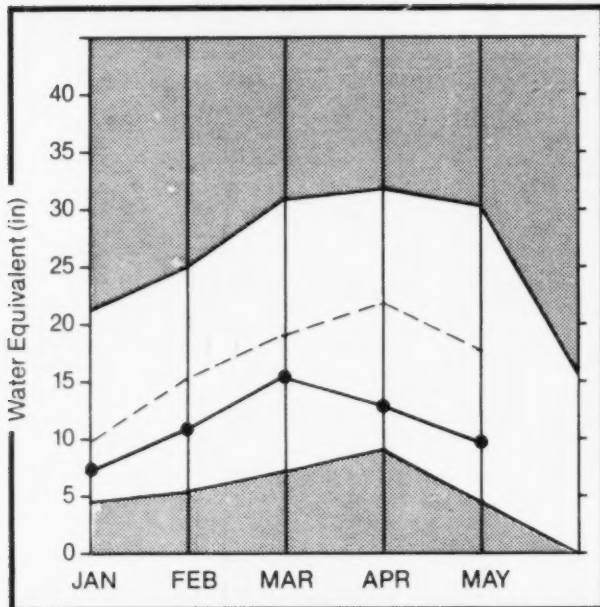
Stored irrigation water supplies are near average for June 1. The Yakima Basin has 937,600 acre-feet in the five major reservoirs which is average for June 1. Chelan Lake is at 133% of normal; Coeur d' Alene Lake is at 96%, and the Okanogan storage is at 99%. FDR lake is at 121% of average and the north Puget storage is at 112%.

STREAMFLOW:

Streamflow was near average in Washington rivers during May. The Chehalis River with 157% of average was the highest while the Spokane River with 55% was the lowest. Some flooding was experienced along the Okanogan River during the last of May; flooding was contained in the lowlands with only minor damages to homes. Streamflows were high during the last week of May as the warm weather melted the remaining snow.

SPOKANE

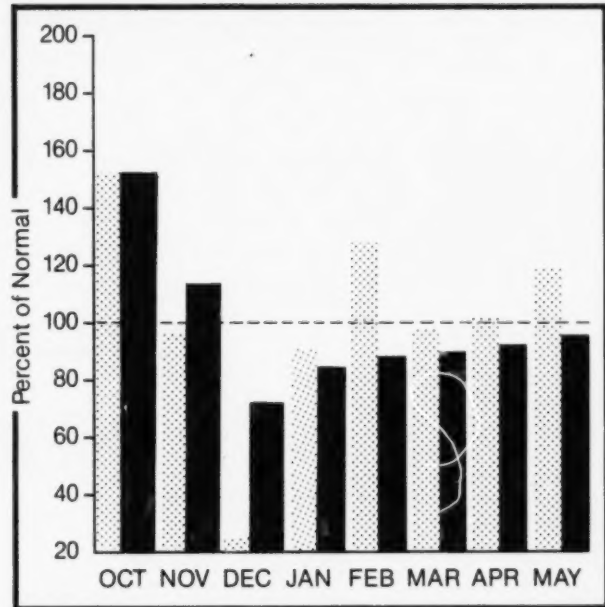
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average
Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

SPOKANE RIVER BASIN

WATER SUPPLY OUTLOOK:

Reservoir storage in Coeur d' Alene Lake is near average at 96%. Only one snow course was read in the basin this month and that showed 52% of normal. Streamflow in the Spokane River was 55% of normal for May, and the May-September flows are forecasted to be 52% of average. Temperatures averaged 1 degree above normal with the last week of May outweighing the much cooler first two weeks of the month.

For more information contact your local Soil Conservation Service office.

SPOKANE RIVER BASIN

STREAMFLOW FORECASTS

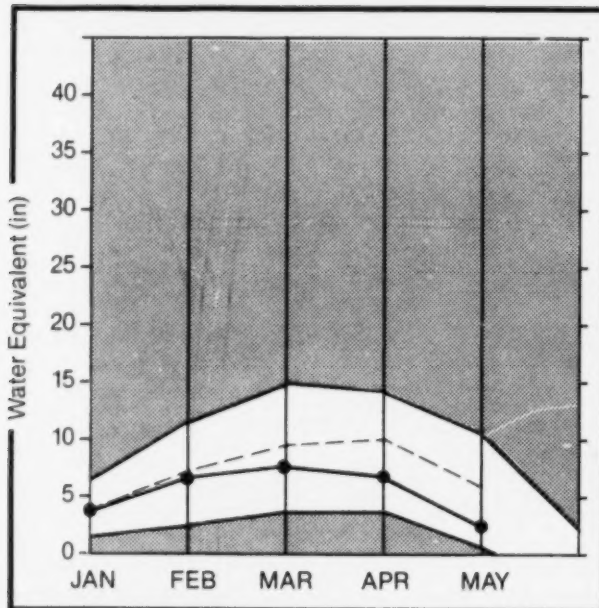
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SPOKANE at Post Falls	MAY-SEP	1977.0	1030.0	52	74	30				
	MAY-JUL	1884.0	970.0	51	73	30				

RESERVOIR STORAGE (1000AF)				WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	THIS YEAR	XX USEABLE STORAGE LAST YEAR AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE	
COEUR D'ALENE	225.1	215.0	253.7	Spokane River	2	68	49

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

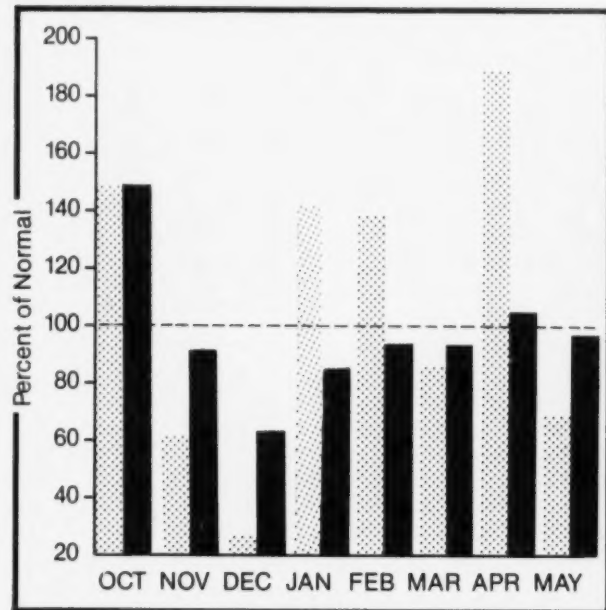
COLVILLE AND PEND OREILLE

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum  Average 
Minimum  Current 

Monthly precipitation  Year to date precipitation 

COLVILLE - PEND OREILLE RIVER BASINS

WATER SUPPLY OUTLOOK:

The Bunchgrass SNOTEL site was bare of snow on June 1. The last week in May saw nearly one foot of snow water leave the site. Streamflows in the basin for May were as follows: the Pend Oreille 74%, Kettle River 97% and the Columbia River at the International Boundary 90%. Precipitation for May was 68% of average bringing the year to date total down to 96% of average. Streamflows for May-July are forecast to be 79% on the Kettle River, 65% on the Colville and 66% on the Pend Oreille River.

For more information contact your local Soil Conservation Service office.

COLVILLE - PEND OREILLE RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
PEND OREILLE RIVER b1 Box Canyon	MAY-SEP	13316.0	8830.0	66	86	46				
	MAY-JUL	12047.0	7900.0	66	86	46				
	MAY-JUN	10119.0	6680.0	66	86	46				
CHANDKANE CREEK	JUL-AUG	3.6	2.9	81	111	28				
COLVILLE RIVER at Kettle Falls	MAY-SEP	85.1	55.0	65	101	28				
	MAY-JUL	74.3	48.0	65	101	28				
	MAY-JUN	66.0	43.0	65	102	29				
KETTLE RIVER nr Laurier	MAY-SEP	1581.0	1260.0	80	98	62				
	MAY-JUL	1491.0	1180.0	79	97	61				
	MAY-JUN	1334.0	1050.0	79	97	61				
COLUMBIA RIVER at Birchbank *	MAY-SEP	41733.0	40600.0	97	110	84				
	MAY-JUL	32833.0	31800.0	97	110	84				
	MAY-JUN	23155.0	22460.0	97	110	84				
COLUMBIA RIVER at Grand Coulee *	MAY-SEP	60100.0	53600.0	89	100	78				
	MAY-JUL	49400.0	43500.0	88	99	77				
	MAY-JUN	37300.0	32820.0	88	99	77				

RESERVOIR STORAGE

(1000AF)

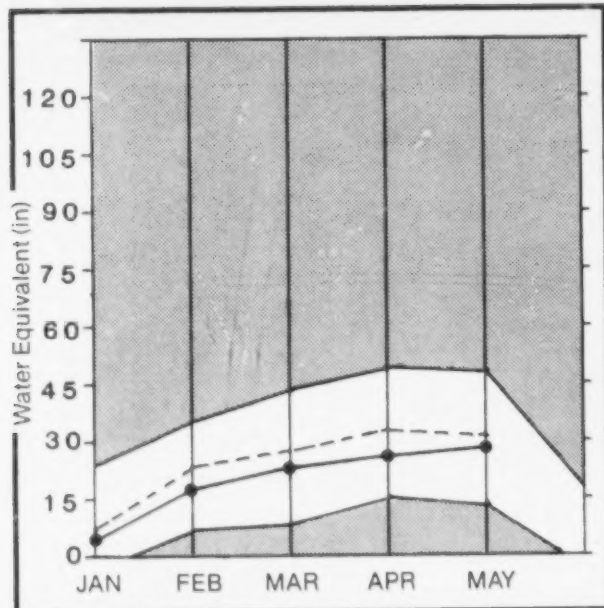
WATERSHED SNOWPACK ANALYSIS

RESERVOIR	USEABLE CAPACITY	THIS YEAR	LAST YEAR	USEABLE STORAGE AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE	
ROOSEVELT	5232.0	2990.6	1661.6	2851.0	Colville River	0	0	0
BANKS	715.0	688.2	685.5	418.0	Pend Oreille River	4	57	37
					Kettle River	1	0	0
					Omac Lake, Twin Lakes	0	0	0
					Newman Lake	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

OKANOGAN AND METHOW

Mountain snowpack* (inches)



*Based on selected stations

Maximum



Average



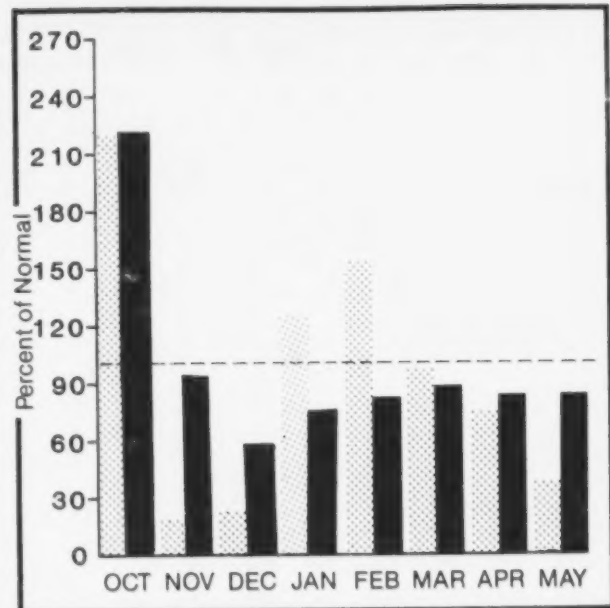
Minimum



Current



Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation



Year to date precipitation



OKANOGAN - METHOW RIVER BASINS

WATER SUPPLY OUTLOOK:

Reservoir storage in the Okanogan Basin is near average. Precipitation for the Month of May was 35% of normal bringing the year to date to 82% of average. There were eight manual snow courses read in the Okanogan Basin for the June 1. Snow cover averaged 92% of normal. These courses were in the Canadian part of the basin. Streamflows during the last week of May were at flood stage on the Okanogan River. For May the flow averaged 98% for the Okanogan and 97% on the Similkameen.

For more information contact your local Soil Conservation Service office.

OKANOGAN - METHOW RIVER BASINS

STREAMFLOW FORECASTS

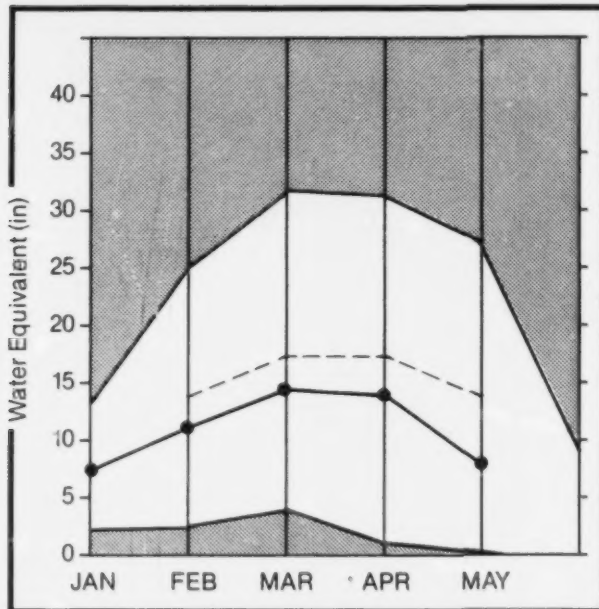
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SIMILKAMEEN R. nr Nighthawk	MAY-SEP	1376.0	1070.0	78	106	50				
	MAY-JUL	1279.0	990.0	77	105	49				
	MAY-JUN	1075.0	830.0	77	105	49				
OKANOGAN R. nr Tonasket	MAY-SEP	1517.0	1180.0	78	107	49				
	MAY-JUL	1370.0	1060.0	77	106	48				
	MAY-JUN	1135.0	870.0	77	106	48				
METHOW RIVER nr Pateros	MAY-SEP	900.0	720.0	80	104	56				
	MAY-JUL	828.0	650.0	79	103	54				
	MAY-JUN	693.0	555.0	80	104	56				

RESERVOIR STORAGE		(100CAF)			WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	THIS YEAR	LAST YEAR	AVERAGE	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	% OF AVERAGE
CONCONULLY LAKE (SALMON)	10.5	9.2	10.5	9.0	Okanogan River	8	184	92
CONCONULLY RESERVOIR	13.0	9.3	11.0	9.0	Methow River	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WENATCHEE AND CHELAN

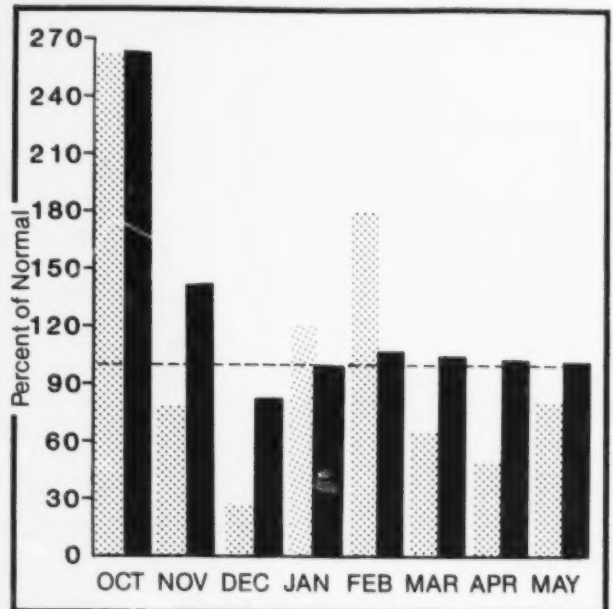
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

WENATCHEE - CHELAN RIVER BASINS

WATER SUPPLY OUTLOOK:

Forecasted streamflow are 79% of average for the Wenatchee at Plain and 80% of normal on the Entiat Rivers and Chelan River. May streamflow was 91% of normal on the Chelan River, and 81% on the Wenatchee. Precipitation was 79% of average over the basin bringing the water year to date to 101% of normal. Storage in Chelan Lake was 599,000 acre feet or 133% of average.

For more information contact your local Soil Conservation Service office.

WENATCHEE - CHELAN RIVER BASINS

STREAMFLOW FORECASTS

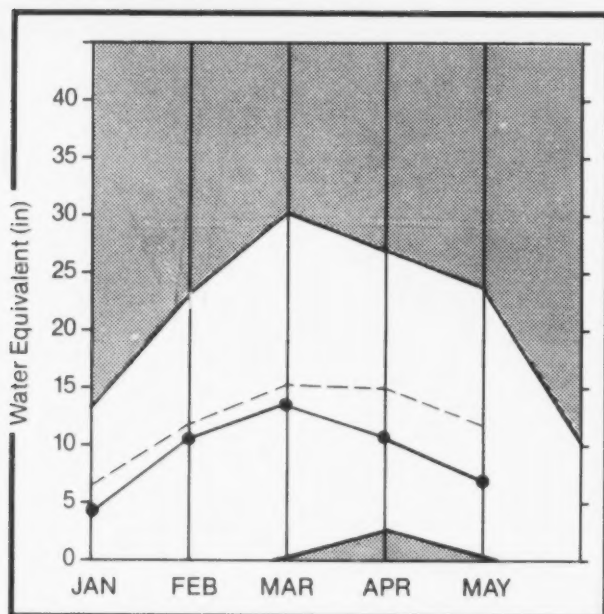
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
CHELAN RIVER at Chelan *	MAY-SEP	1094.0	880.0	80	95	65				
	MAY-JUL	946.0	760.0	80	95	65				
	MAY-JUN	717.0	580.0	81	96	66				
STEHEKIN R. at Stehekin	MAY-SEP	860.0	710.0	83	93	73				
	MAY-JUL	727.0	600.0	83	93	72				
	MAY-JUN	553.0	460.0	83	93	73				
ENTIAT RIVER nr Ardenvoir	MAY-SEP	218.0	170.0	78	93	63				
	MAY-JUL	197.0	160.0	81	96	66				
	MAY-JUN	155.8	124.0	80	94	65				
WENATCHEE RIVER at Plain	MAY-SEP	1136.0	900.0	79	112	46				
	MAY-JUL	1002.0	790.0	79	112	46				
	MAY-JUN	765.0	600.0	78	111	45				
WENATCHEE R. at Peshastin	MAY-SEP	1523.0	1190.0	78	111	45				
	MAY-JUL	1356.0	1060.0	78	111	45				
	MAY-JUN	1048.0	820.0	78	111	45				
STEMILT nr Wenatchee (miners in)	MAY-SEP	138.0	105.0	76	109	43				
ICICLE CREEK nr Leavenworth	APR-SEP	370.0	280.0	76	109	43				
	APR-JUL	340.0	265.0	78	111	45				
	APR-JUN	270.0	210.0	78	111	45				
COLUMBIA R. bl Rock Island Dam *	MAY-SEP	65550.0	58700.0	90	101	79				
	MAY-JUL	54375.0	48000.0	88	99	77				
	MAY-JUN	41160.0	36225.0	88	99	77				

RESERVOIR STORAGE		(1000AF)			WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE	THIS YEAR	LAST YEAR	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	% OF AVERAGE
CHELAN LAKE	676.1	599.0	428.2	---	Chelan Lake Basin	0	0	0
					Entiat River	0	0	0
					Wenatchee River	0	0	0
					Colockum Creek	0	0	0
					Squilchuck Creek	0	0	0
					Stemilt Creek	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

YAKIMA

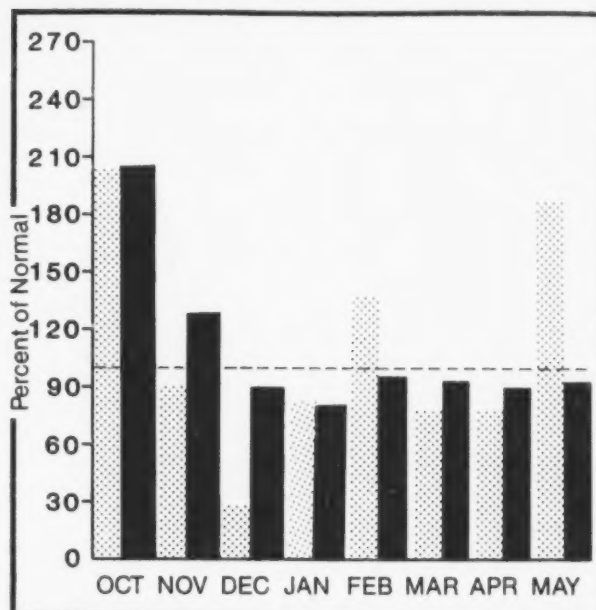
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average
Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

YAKIMA RIVER BASIN

WATER SUPPLY OUTLOOK:

The overall outlook for the Yakima River Basin has not changed significantly from last month. Streamflow forecasts range from 72 to 80% throughout the entire basin. Precipitation was above average for May at 186% bringing the water year to date to 93% of normal. Storage in the five major reservoirs was at 937,600 acre feet or 100% of average. May streamflow was 50% of average.

For more information contact your local Soil Conservation Service office.

YAKIMA RIVER BASIN

STREAMFLOW FORECASTS

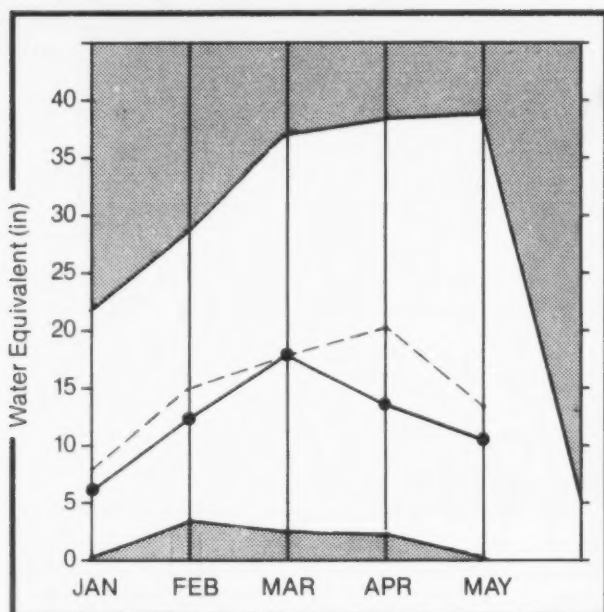
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
YAKIMA RIVER at Martin *	MAY-SEP	114.0	90.0	79	91	67				
	MAY-JUL	103.0	80.0	78	89	66				
	MAY-JUN	86.0	68.0	79	91	67				
YAKIMA RIVER at Cle Elum *	MAY-SEP	780.0	610.0	78	91	65				
	MAY-JUL	693.0	540.0	78	91	65				
	MAY-JUN	574.0	450.0	78	91	65				
YAKIMA RIVER nr Parker *	MAY-SEP	1711.0	1230.0	72	91	53				
	MAY-JUL	1510.0	1080.0	72	91	53				
	MAY-JUN	1274.0	920.0	72	91	53				
KACHESS RIVER nr Easton *	MAY-SEP	96.0	76.0	78	92	63				
	MAY-JUL	92.0	71.0	77	91	63				
	MAY-JUN	78.0	60.0	77	91	63				
CLE ELUM RIVER nr Roslyn *	MAY-SEP	400.0	310.0	78	90	66				
	MAY-JUL	360.0	277.0	77	89	65				
	MAY-JUN	291.0	225.0	77	89	65				
BUMPING RIVER nr Nile *	MAY-SEP	126.0	100.0	79	94	64				
	MAY-JUL	114.0	90.0	79	94	64				
	MAY-JUN	91.0	73.0	80	96	65				
AMERICAN RIVER nr Nile	MAY-SEP	114.0	90.0	79	91	67				
	MAY-JUL	103.0	80.0	78	89	66				
	MAY-JUN	82.0	65.0	79	91	67				
TIETON RIVER at Tieton *	MAY-SEP	214.0	164.0	77	93	61				
	MAY-JUL	175.0	135.0	77	93	61				
	MAY-JUN	133.0	102.0	77	92	61				
NACHES RIVER nr Naches *	MAY-SEP	728.0	570.0	78	92	64				
	MAY-JUL	645.0	500.0	78	91	64				
	MAY-JUN	530.0	415.0	78	92	64				
AHTANUM CREEK nr Tappico *	MAY-SEP	39.0	29.0	74	97	51				
	MAY-JUL	35.0	26.0	74	97	51				
	MAY-JUN	29.0	22.0	76	97	53				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	THIS YEAR	LAST YEAR	AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE	
KEECHULUS	157.8	125.1	154.0	144.0	Yakima River	3	24	15
KACHESS	239.0	213.9	236.7	218.0	Ahtanum Creek	0	0	0
CLE ELEM	436.9	384.5	352.4	378.0				
BUMPING LAKE	33.7	34.5	32.8	27.0				
RIMROCK	198.0	179.9	157.2	167.0				

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WALLA WALLA

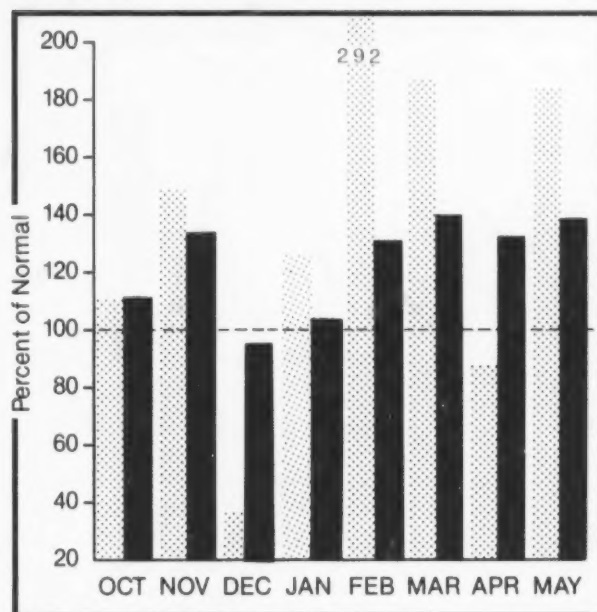
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average
Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

WALLA WALLA RIVER BASIN

WATER SUPPLY OUTLOOK:

Precipitation was at 183% of average for May which brought the water year to date total to 138% of normal. Streamflow in the Walla Walla River was 74% of average for May. Forecasted streamflow in the Walla Walla River is 76% of normal for the May-July period. Temperatures for the month were average with the cold first two weeks balanced out by the warmer temperatures last week. Snow has melted at the Touchet SNOTEL site.

For more information contact your local Soil Conservation Service office.

WALLA WALLA RIVER BASIN

STREAMFLOW FORECASTS

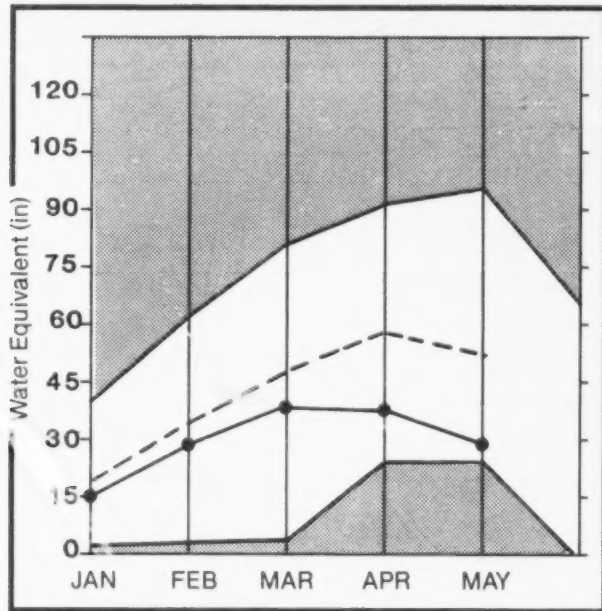
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
MILL CREEK NEAR WALLA WALLA	MAY-SEP	7.7	5.9	77	117	39				
	MAY-JUN	7.3	5.5	75	110	41				
	MAY-JUL	7.5	5.7	76	120	40				
COLUMBIA R. at The Dalles *	MAY-SEP	88290.0	77800.0	88	101	75				
	MAY-JUL	73760.0	62800.0	85	98	72				
	MAY-JUN	57360.0	48800.0	85	98	72				

RESERVOIR STORAGE		(1000AF)	WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF	
	THIS YEAR	LAST YEAR AVE.			LAST YR.	AVERAGE
			Mill Creek	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

COWLITZ AND LEWIS

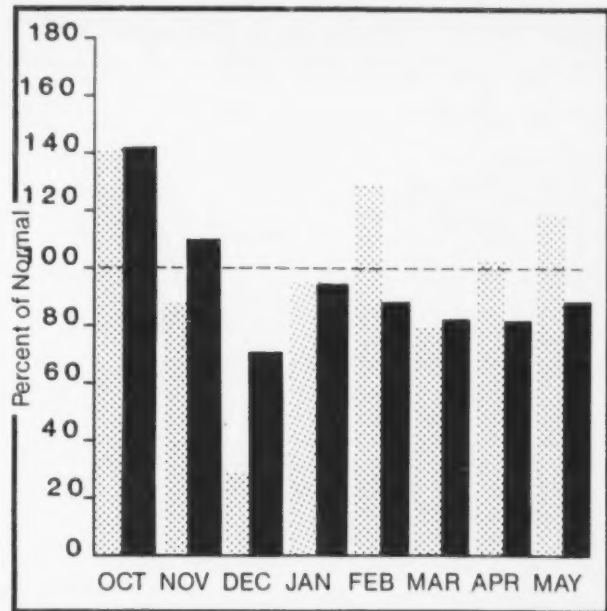
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

COWLITZ - LEWIS RIVER BASINS

WATER SUPPLY OUTLOOK:

Nearly all snow has melted from the watershed during the last week in May. The SNOTEL sites above 4000 feet are showing small amounts of water left on the pillows. Precipitation during May was 118% of normal bringing the water year to date to 88% of average. Streamflow for May was 97% of normal on the Cowlitz River. Forecasted streamflow on the Lewis River for the May-July period is 88% of average and 80% for the Cowlitz River at Castle Rock.

For more information contact your local Soil Conservation Service office.

COWLITZ - LEWIS RIVER BASINS

STREAMFLOW FORECASTS

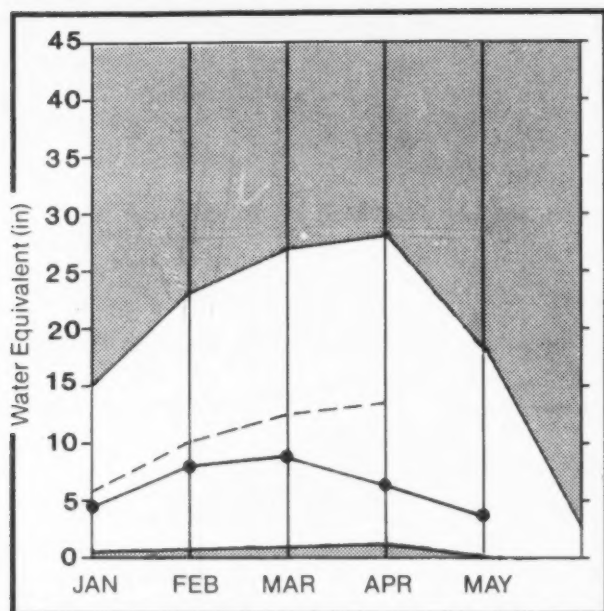
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
LEWIS RIVER at Ariel *	MAY-SEP	900.0	790.0	88	112	64				
	MAY-JUL	737.0	650.0	88	112	64				
	MAY-JUN	612.0	540.0	88	112	64				
COWLITZ R. bl Mayfield Dam *	MAY-SEP	1617.0	1250.0	77	126	28				
	MAY-JUL	1357.0	1045.0	77	126	28				
	MAY-JUN	1081.0	830.0	77	126	28				
COWLITZ R. at Castle Rock *	MAY-SEP	2058.0	1650.0	80	129	31				
	MAY-JUL	1708.0	1370.0	80	129	31				
	MAY-JUN	1365.0	1090.0	80	129	31				

RESERVOIR STORAGE		(1000AF)	WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE	THIS YEAR	LAST YEAR	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE
	I	THIS YEAR	LAST YEAR	AVE.		
					Cowlitz River	1 30 8
					Lewis River	0 0 0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WHITE - GREEN

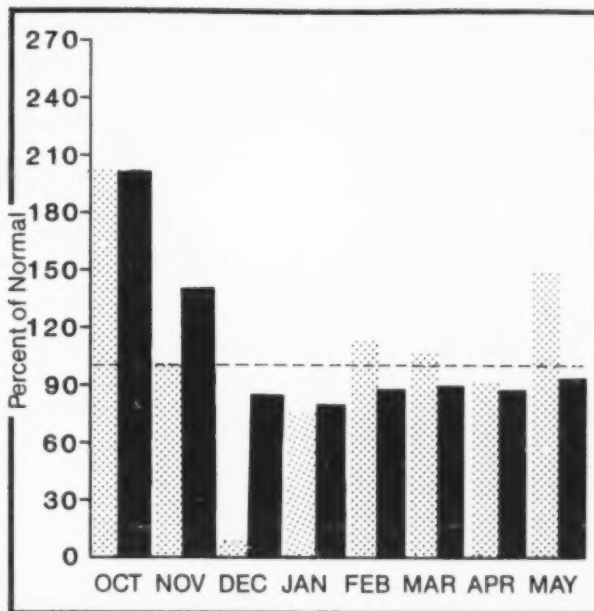
Mountain snowpack* (inches)



*Based on selected stations



Precipitation* (percent of normal)



*Based on selected stations



WHITE - GREEN RIVER BASINS

WATER SUPPLY OUTLOOK:

Precipitation for May was 149% of average in the Green-White River Basins. Forecasted streamflow remains below normal with 70% forecast for the Green River and 73% on the Cedar River. The year to date precipitation is 93% of normal.

For more information contact your local Soil Conservation Service office.

WHITE - GREEN RIVER BASINS

STREAMFLOW FORECASTS

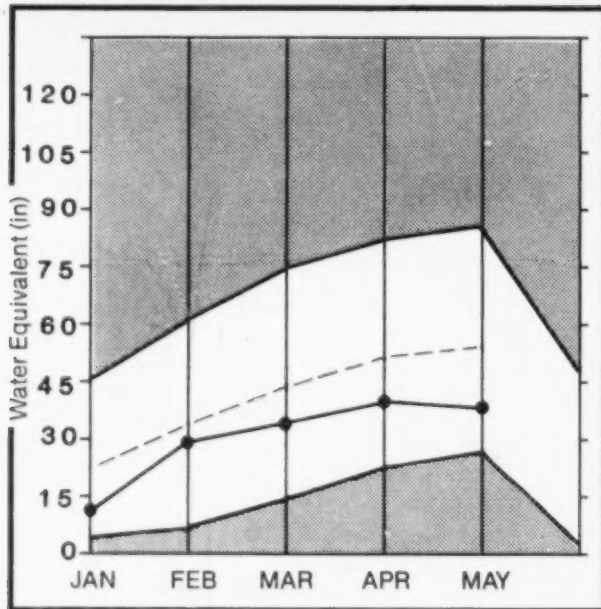
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
GREEN RIVER b1 Howard Hanson Dam *	MAY-SEP	316.0	225.0	71	88	54				
	MAY-JUL	284.0	200.0	70	87	54				
	MAY-JUN	256.0	180.0	70	82	48				
CEDAR RIVER nr Cedar Falls	MAY-SEP	74.2	54.0	73	90	55				
	MAY-JUL	65.5	48.0	73	90	56				
	MAY-JUN	54.1	40.0	74	91	57				

RESERVOIR STORAGE		(1000AF)		WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	*** USEABLE STORAGE ***		WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE
	THIS YEAR	LAST YEAR	AVE.			
				White River	0	0 0
				Green River	1	23 20

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

NORTH PUGET SOUND

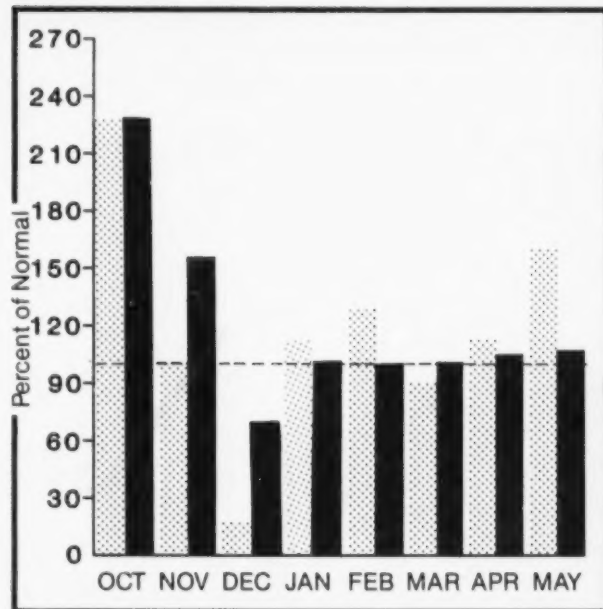
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

NORTH PUGET SOUND RIVER BASINS

WATER SUPPLY OUTLOOK:

There were no manual snow courses read for the June 1 reporting period. The Harts Pass SNOTEL site has 29.1 inches of water content remaining on the pillows as of the June 1. Precipitation for the month of May averaged 160% of normal bringing the water year to date to 107% of average. Streamflow for May was 82% of normal on the Skagit River. Forecasted streamflow for the Skagit River for the May-July period is 80% of average. Reservoir storage in Ross is 112% of normal for June 1.

For more information contact your local Soil Conservation Service office.

NORTH PUGET SOUND RIVER BASINS

STREAMFLOW FORECASTS

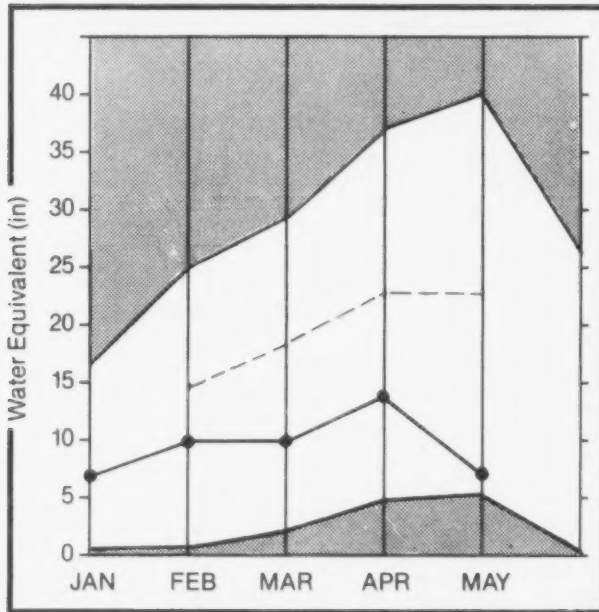
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SKAGIT RIVER at Newhalem *	MAY-AUG	2532.0	2030.0	80	95	65				
	MAY-SEP	2356.0	1880.0	80	95	65				
	MAY-JUL	1972.0	1580.0	80	95	65				
	MAY-JUN	1485.0	1190.0	80	95	65				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE THIS YEAR	** USEABLE STORAGE LAST YEAR	** AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE
ROSS	1404.1	1140.9	1011.5	---	Skagit River	0	0 0
DIABLO RESERVOIR	90.6	87.2	86.8	---	Baker River	0	0 0
GORGE RESERVOIR	9.8	7.3	8.2	---	Cedar River	0	0 0
					Snoqualmie River	0	0 0
					Skykomish River	0	0 0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

OLYMPIC

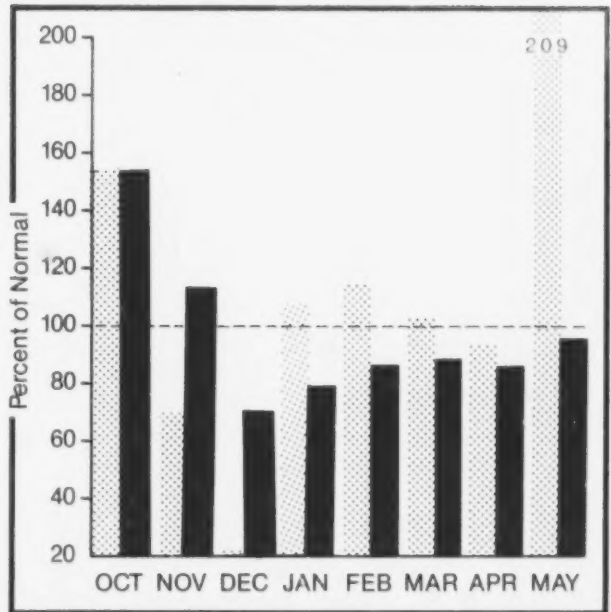
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

OLYMPIC PENINSULA RIVER BASINS

WATER SUPPLY OUTLOOK:

Forecasts of streamflow for the Olympic Peninsula Rivers is much the same as last month at 72-73% for the May-July period. Precipitation for May was 209% of average with the Quillayute WSO reporting 11.02 inches. The water year to date total is 95% of average. All snow has left the Carrol Pass snow pillow.

For more information contact your local Soil Conservation Service office.

OLYMPIC PENINSULA RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
DUNGENESS RIVER nr Sequim	MAY-SEP	160.0	116.0	73	89	56				
	MAY-JUL	130.0	94.0	72	89	55				
	MAY-JUN	97.0	70.0	72	89	56				
ELWAHA RIVER nr Port Angeles	MAY-SEP	553.0	400.0	72	89	55				
	MAY-JUL	454.0	325.0	72	89	55				

RESERVOIR STORAGE ('1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE	THIS YEAR	LAST YEAR	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE	
				AVE.				
					Dungeness River	0	0	0
					Morse Creek	0	0	0
					Elwha River	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

CONSERVE YOUR IRRIGATION WATER

Can irrigators use less water and get good yields? We think so. With energy costs on an upward spiral and water shortages likely, we offer these water saving ideas to irrigators.

Consider ditch lining or gated pipe. This will reduce the 10-90 percent loss which occurs in earh ditches.

Keep ditches clean and free from weeds, sediment, or other debris, which can slow water velocity, affect delivery rate, and increase evaporation.

Make sure headgates, drop structures, and pipe inlets are operational. A washed-out structure is water lost.

Inspect ditchbanks for rodent damage. Rodent holes cause leakage or failures.

Make sure sprinkler nozzles aren't worn or leaky. Check pipe connections and valves to prevent leaks.

Operate sprinklers at recommended pressure to effectively use available water.

Maintain your pump at peak efficiency to save energy.

BETTER WATER MANAGEMENT

Better water management may require more labor. It may require changing a head of water in the middle of the night. But it will be worth it. You should:

Measure your water to determine how much is applied.

Consider alternate row irrigation for crops planted in furrows.

Plan short runs. Match stream size and velocity to soil intake rate and capacity.

Catch and reuse tail water.

Underirrigate the lower end of field to stretch your water.

And when water is short, consider eliminating that last irrigation.

Soil Conservation Service personnel can:

Help plan and design new irrigation systems or evaluate existing ones.

Provide technical assistance for land leveling, pipeline installation, and other practices.

KNOW YOUR SOIL

Soil absorbs irrigation water at a given rate. This varies with each soil type. Some crops require more water than others. Check soil moisture by spade, probe, or moisture meter. Or use the "feel" method.

WHEN IRRIGATION IS NEEDED, SOIL WILL FEEL AND ACT THIS WAY

Soil Texture	A handful of soil will
Coarse	Tend to stick together slightly, but will not form a ball.
Medium	Be crumbly, but will form a ball.
Fine	Be pliable, and will form a ball.

If you have a conservation plan on your farm, or if the soil in your area has been mapped, the Soil Conservation Service can crosscheck soil type and irrigation data and provide you with the water holding capacity of your soil for a given crop.

Snow Survey data can be obtained by calling one of the following local SCS offices:

PULLMAN PMC

Office (509) 335-7376
Farm (509) 335-9689

OLYMPIA, Area I

Area Office	FTS	434-9454 or 9455
Chehalis	(206)	748-0083
Kelso	(206)	425-1880
Lake Stevens	FTS	392-9259
Lynden	(206)	354-5658
Montesano	(206)	249-5900
Mt. Vernon	(206)	424-5153
Olympia FO	FTS	434-9448
Port Angeles	FTS	396-4277
Port Orchard	(206)	876-5529
Puyallup	(206)	845-5533
Raymond	(206)	942-5945
Renton	FTS	399-3325 or 3326
Vancouver	FTS	422-7631

EPHRATA, AREA II

Area Office	FTS	446-4374 or 4375
Davenport	(509)	725-4181 or 725-1345
Ephrata FO	FTS	446-4385
Moses Lake	(509)	765-3261
Okanogan	(509)	422-2750
Othello	(509)	488-2802
Ritzville	(509)	659-0254
Waterville	(509)	745-8362
Wenatchee	FTS	390-0242 or 0260

YAKIMA, AREA III

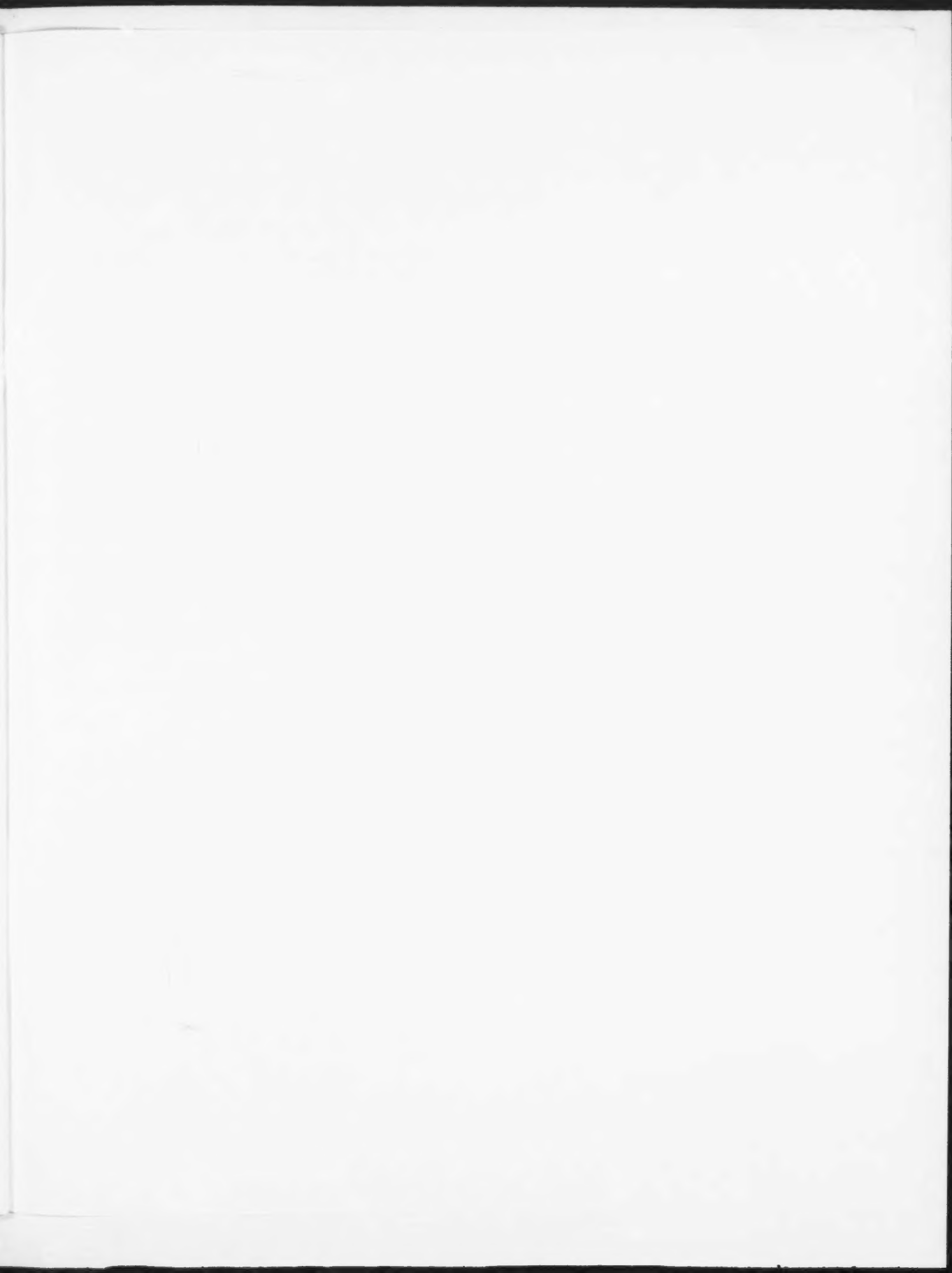
Area Office	FTS	446-5865 or 5866
Ellensburg	(509)	925-5375
Goldendale	(509)	773-5823
Pasco	(509)	545-8546 or 8547
Prosser	(509)	786-1923
Sunnyside	(509)	837-7911
Toppenish	(509)	865-4012
Walla Walla	FTS	434-6340
White Salmon	(509)	493-1936
Yakima FO	FTS	446-5909

SPOKANE, AREA IV

Area Office	FTS	439-3726
Cheney	(509)	458-6200, Ext 2309
Clarkston	(509)	758-8012
Colfax	(509)	397-4636
Colville	(509)	684-5067
Dayton	(509)	382-2351
Fairfield	(509)	283-2331
Newport	(509)	447-4217
Pomeroy	(509)	843-1998
Republic	(509)	775-3473
Spokane FO	FTS	439-2120

SOIL SURVEY OFFICES

Bellingham	(206)	676-3520
Inchelium	(509)	722-4395
Nespelem	FTS	439-9431
Wapato	(509)	877-4004





The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

- Canada:** Ministry of the Environment, Water
Investigations Branch, Victoria, British Columbia
- States:** Washington State Department of Ecology
Washington State Department of Natural Resources
- Federal:** Department of the Army
Corps of Engineers
U.S. Department of Agriculture
Forest Service
U.S. Department of Commerce
NOAA, National Weather Service
U.S. Department of the Interior
Bonneville Power Administration
Bureau of Reclamation
Geological Survey
National Park Service
Bureau of Indian Affairs
- Local:** City of Tacoma
City of Seattle
Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company
Snohomish County P.U.D.
- Private:** Okanogan Irrigation District
Wenatchee Heights Irrigation District
Newman Lake Homeowners Association

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ROOM 360, U.S. COURT HOUSE
SPOKANE, WASHINGTON 99201

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300

THIRD-CLASS BULK RATE
POSTAGE AND FEES PAID
USDA - SCS
SPOKANE, WA
PERMIT NO G-267

THIRD CLASS MAIL

**Washington
Water Supply Outlook**

and

Federal — State — Private
Cooperative Snow Surveys



SOIL CONSERVATION SERVICE

GPO 1983 696-712

